MASSACHUSETTS

AGRICULTURAL JOURNAL.

Vol. VI.] JULY, 1821. [No. IV.

ESSAYS ON FLAX HUSBANDRY. BY S. W. POMEROY, Esq.

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ESSAY I.

THE great surplus and depressed prices of our chief agricultural products, render it necessary for the farmer to seek others upon which he may calculate for more profitable returns, or at least such as will constitute a division of his risk; with this view *Flax* may be presented as an item deserving particular consideration.

For twenty years preceding 1816, the annual export of *Flax Seed* from the United States, averaged but about 250 thousand bushels! When we were British colonies, with one fifth of the present population, and a territory under cultivation probably much less in proportion, there was exported in one year (1770) upwards of 312,000 bushels.* It is very obvious, that the causes of this decrease, so disproportionate to the increase of all other products of the soil, may be attributed to the introduction of vast floods of cotton fabricks and yarns, at prices (nominally) very low, and the unexampled demand for breadstuffs and other food, during the period referred to. The effect has been to place *flax farming*

* Pitkin's Statistical View.

so far in the back ground, as scarcely to attract the attention of agricultural societies, when engaged in promoting improved methods of cultivation for other crops; and also, it is feared, to curtail *household manufactures*, the extension of which, it will not be denied, is eminently conducive to the prosperity of an agricultural people. For although prudent farmers have usually a *small patch*, the object has been so inconsiderable as not to demand any particular care in its management, and a tolerable crop, which, in Europe is considered as certain as any they raise, is supposed in many sections of New-England to be the effect of chance, or, as it is termed, *good luck*.—We will not pretend that Flax was at any period in this country estimated as a profitable, though formerly a necessary crop. But it is presumed, such has been the acquisition of knowledge, and improvements in agriculture, and especially those branches of mechanical science connected with it, that an entire new view may be taken of Flax husbandry—that it may be made to enter into the agricultural system of the country much more extensively than heretofore, and possibly be ranked as a considerable, and not unprofitable staple. With these impressions I have devoted some attention to the subject, and shall submit such information as I have been enabled to collect from various authentic sources; together with some remarks and intimations, which, should they throw no light on the question, may promote enquiry, and induce others, possessing better qualifications and more experience, to pursue the investigation.

My attention was drawn to the present object, in consequence of viewing the manufactories of sail cloth at *Paterson*, near the falls of the Passaic in New-Jersey, the last autumn: where I was informed that 6,000 bolts of Duck had been made for the Navy, the year preceding, of a quality superior to what I was prepared to expect, and which is pronounced, by those experienced in nautical affairs, to be worth, for service, from 30 to 50 per cent. more than can-

vas imported from Russia! Indeed the respectable and liberal proprietors of those establishments are entitled to great credit for the perfection of this article; it is presumed they have conformed to the particular stipulations of their contracts with the commissioners of the navy board, who in this instance, as in others, are conspicuous for their attention to those minute details so necessary to insure solidity and permanence to what pertains to that department. But the political economists, and perhaps some farmers of the United States, will be surprised when told, that "the *flax*, from which this sail cloth was fabricated, was *imported* from Ireland and the Baltic! that if a sufficient quantity of native growth, could have been procured (which was doubtful) it does not possess sufficient strength to make such canvas, as the navy board would, or ought to have been satisfied with!" The question occurs, What is the cause of this inferiority? It will not be pretended, we believe, that there is any inherent defect in the soil, or that the climate is uncongenial to its perfection. On the other hand it will be admitted that there is nothing so peculiarly favourable, as to require less attention and care in the cultivation, than is bestowed in those countries in Europe, where it forms an important agricultural staple, and where similar management would unquestionably produce the same effects: for, however plausible the prevalent opinion may be, that the inferiority of American flax is owing solely to the injudicious preparation by *dew rotting*, and we will grant it is one very prominent cause, still there are others, which will be noticed in the sequel, that may be considered as having a very powerful influence in deteriorating the *quality*, as well as lessening the product.

The common flax plant (*Linum Usitatissimum*) possesses habits more peculiar than any other within the range of our cultivation: and it may be useful in order to reconcile the farmer and to impress on his mind the importance of attending to those habits, to trace this plant to its native soil, or rather to the country where they were acquired by cultiva-

tion, for a vast series of ages—for it is not improbable that, like the *small grains*, its present appearance is essentially different from that in its indigenous state; but to which it seems to be returning, in some parts of our country, by gradations less imperceptible, than it may have originally advanced.

Linen is mentioned at a very early period of sacred history as the production ONLY OF EGYPT. The most ancient and credible author of profane history* speaks of its remote antiquity being peculiar to that country: and those writers, who treat of the fabulous ages, ascribe the culture of Flax and invention of spinning and weaving to ISIS, a queen of Egypt; the *Ceres* of the *Greeks*, to whom they attribute the discovery of bread corn. But if there was any question on this point, the *habits* of the *Flax plant* denote its most natural soil to have been on the margin of a river annually inundated, subsiding exactly at the period of seed time, leaving an entire new soil, or, by forming new combinations, completely renovating the old, which soon becoming dry, mellow and friable at top—retaining, or having conducted by art, sufficient moisture at bottom, aided by copious dews to ensure its maturity, but never any rain or storms to beat it down! where could it have found such a location but on the banks of the Nile?† It has degenerated when transplanted to every other country, probably in proportion to the want of care and attention to assimilate the soil, and gratify that impatience of change, to which it has been so long habituated. Hence it is that Flax owes the reputation of being the most exhausting of all crops. Let us enquire to what extent it may be well founded.

Sir Humphrey Davy remarks, in his "8th lecture on agricultural chemistry," that "it is proved by facts stated in his

* Herodotus, Euterpe. chap. 37. 105.

† The inundation of the Nile begins to decrease about the 20th September. The seeds are sown and the crops perfected while the sun is in the southern tropic.

7th lecture, that plants require different materials from the soil, and that particular vegetables require peculiar principles to be supplied to the land in which they grow." And "as a most remarkable instance of the power of vegetables to exhaust the soil of certain principles," he states "that Mushrooms are said never to rise in two successive seasons on the same spot."—He might have cited *Flax*, as another instance not less remarkable! These facts are further substantiated by the effect produced on the soil, where *old fruit trees* have grown, in retarding the progress of young trees of the same family or species; for instance, a young cherry tree, planted on the spot from which an old one had been dug up, will remain nearly stationary for a length of time with the highest cultivation; remove it to the spot that has been occupied by an old pear tree, and plant a young pear tree in its place, and both will immediately become as flourishing as if no tree had ever been produced on the land. Of this fact I have experienced the most complete demonstration *repeatedly* within the last twenty years. It is, moreover, well known to most farmers, that an *Apple Orchard* will not succeed on land that had before been occupied by one, but that cherry or peach trees will grow vigorously on such land.

From these premises very potent arguments might be drawn in favour of a regular rotation of crops and against summer fallows.—They are here introduced to shew, that although a single crop of Flax will so exhaust the soil of "certain principles," that a repetition cannot take place with any prospect of success, even with large quantities of manure, under a lapse of from four to eight years, according as "those materials" necessary to its growth may be more or less retained, or supplied, yet it does not follow that the soil is exhausted of the *food* necessary to promote the luxuriant growth of other plants! The soundness of this position is supported by the usual practice in Europe and this country, of sowing clover and grass seeds with Flax, which is considered not more exhausting, and a better pro-

tecting crop than Oats or Barley ; and it is probable the result may be similar if we extend the enquiry, but it is unimportant at present, for good husbandry will ever dictate that clover or grass should be the next course in rotation to Flax.

We necessarily look to Europe for instructions in Flax husbandry, and first turn to Ireland, where it was introduced in 1696, under the patronage of William the third, eight years after he left Holland to wield the British sceptre. "An able and impartial enquirer* computes that in less than forty years from that period, the home consumption and exportation of Linen, amounted annually to one million sterling," which, if we allow for the difference in the value of money, may be equal to ten millions of dollars at present, "and this from thirty thousand acres of land ; employing, in raising and manufacture, one hundred and seventy thousand persons." When this trade was in its infancy, the Dublin society was instituted for its promotion, and some years after published several tracts on the culture of Flax ; from which, and from the tour of Arthur Young in that country, we derive some important facts, yet upon the whole, less information is obtained that is applicable to the management in this country, than we were led to expect, owing to the minute subdivision of the land among the cultivators, (a cotter seldom occupying more than a quarter of an acre) the very great difference of climate, and, above all, the uncommon fertility of the soil, which Sir H. Davy, in his 4th lecture, attributes to the proximity of the rocky strata to the soil, in that moist climate. But Mr. Curwen, long a distinguished statesman in the British parliament, and who, as an agriculturist, ranks with Mr. Coke and Sir John Sinclair, made a tour throughout Ireland in 1813 "with views directed to its agriculture and rural population," and to investigate the cause of the misery and degradation of that noble spirited, generous, but mismanaged people, remarks, that "he does not think the causes assigned by Sir H. Davy for this supe-

* See Campbell's Political Survey.

rior fertility are at all satisfactory," that those demi-tints, which in England distinguish lands that are exhausted, are in Ireland almost unknown; the verdure is everlasting and luxuriant, arising, as he should suppose, from some inherent quality of the soil, which keeps it in a proper state to admit the salutary influences of the atmosphere; that the richness of the surface resists all the efforts of man to sterilize it," and he gives the Irish credit for being very persevering in their endeavours for that purpose.* Notwithstanding this extreme fertility, Mr. Curwen says that the Flaxseed raised in Ireland was supposed to produce inferior plants, and that the Linen board of the Dublin society took charge of the importation of foreign Flaxseed for the supply of those who could not otherwise obtain it. This information relates to one of the most important features in flax farming, CHANGE OF SEED, which will be considered in our next essay.

ESSAY II.

CHANGE OF SEED.

NOTWITHSTANDING it is an opinion well established among experienced Flax growers in this country, that a change of seed is advantageous, it is apprehended that they are not aware of the extent of the benefit to be derived by selecting seed from a soil or climate essentially different; and it may be owing to a want of attention in this particular that the flax crops are so uncertain, and the quality inferiour, however perfect in other respects the system may be conducted. Mr. Young observes, that "Foreign flaxseed was universally used in Ireland, when it could be obtained, otherwise they were careful to procure seed which grew upon a soil of an opposite quality from that which was to be sown," that "American seed was preferred, and produced finer Flax

* Observations on the state of Ireland, by J. C. Curwen, Esq. M. P. London, 1818.

than any other. Baltic seed produced more, but of a coarser quality." It is well known that American seed always bears the highest price in the Irish market.

We next look to *Flanders*, where flax was cultivated at a period as early as the commencement of the christian era.* Fortunately we are furnished with "directions for cultivating flax after the Flanders method" published by commissioners and trustees appointed by the British parliament to promote the linen trade in Scotland, at the head of whom was the celebrated Lord Kaims: From this *high authority* we find that it was the practise "to sow seed imported from Riga, if it could be obtained, otherwise the produce of Riga seed sown in Holland, and if that could not be had, that which Riga seed had produced in their own country, being careful to choose that which had grown on soils of a different texture and quality. What is the practice in Germany, where the cultivation is very extensive? By a respectable British publication, now before me,† in which an account is given of the trade of Stettin, a city of Prussian Pomerania, situated at the mouth of the river Oder, it appears that the extent of the linen trade is estimated by the quantity of Flax-seed *imported;* and it is stated that on an average of ten years preceding 1796, twenty-one thousand, six hundred and forty-five tons of Flax-seed were annually imported into that port "to be sent up the Oder and the waters connected with it, which, at forty bushels to the ton, amounts to upwards of eight hundred thousand bushels! sufficient for half a million of acres at the rate it is sown in this country! and it is not improbable that large quantities are imported into other ports connected with the large German rivers.

Foreign Flax-seed was sought after even in the remote vallies of Switzerland, as appears by the following extract from a treatise on the culture of Flax by Mr. Tschiffeli,

* Pliny's Nat. Hist: Book 19.

† Commercial & Agri. Mag. vol. iii. 1800.

president of the economical society of Berne. "In general the best flax seed is produced on strong soils and in cold climates. Experience has long convinced us that what is brought from Livonia" (Riga seed) "is to be preferred to all others, but when this cannot be procured, we must make use of that which grows on our own mountains, for instance Gessenai, Jura," &c.

A Flemish colony first settled the island of Fayal, and introduced Flax. They have become amalgamated with the Portuguese, but the culture, and manufacture of linen in families, has continued to an extent nearly equal to the cloathing and general consumption of a very dense population. The soil is mostly in tillage, and from its elevation admits of a variety of aspect and temperature, and great care is bestowed on the culture of *Flax*. I have been informed by Mr. Dabney, the United States consul for the Azores, who has resided fifteen years at Fayal, that in several instances, American seed, obtained from ships bound to Ireland, arriving in distress, has been sown; and the product, in *flax* and *seed*, has been fifty per cent. more than from that of native growth by the side of it! We have no information to this point from Russia or Italy; but it is believed that examples enough have been cited to shew the importance attached to this branch of the system in Europe, and to justify the conclusion that in this country a continued, judicious change of seed will be indispensable to the successful prosecution of flax husbandry; and a further inference may be drawn, that experiments on various soils from seed the growth of different climates, are requisite to direct the farmer to the quarter from whence his best seed may be obtained. Here opens a legitimate field for our numerous agricultural societies to labour in; on their exertions the farmer must depend in the outset; but let it once be ascertained that Riga seed is best in one section, Dutch or German in others, and mercantile *interest*, if not patriotism, will soon distribute them.

Should it be objected to importing seed on account of the expense, we reply, that large quantities of linseed oil are constantly imported, and the difference of price between our own seed and that imported, will not much exceed what is now paid for good clean seed for sowing or export, and that which is sold for crushing; but if it is fifty cents per bushel, or more, it can be no object, compared with the advantages that may be reasonably expected to result, and the farmer need not be told, that, "in all his operations, *parsimony* is never so ill judged, as when exercised in the selection of his seeds." It is not pretended, however, but that, from the great variety of soil and climate in the United States, the object in view might be obtained without importations; yet, it may be important to have a good stock to begin with, when trials could be instituted with its produce; at any rate it cannot be expected that individuals will embark in such a course of experiments, either with foreign or domestic seed, unless encouraged by agricultural societies or other public bodies.

SOILS.

The subject presents a character of such national importance, that a wider range must be taken than views of mere local interests require; we shall therefore first examine, under the present head, the different sections of our country. *New soils* are found most favourable to the growth of the flax plant; and it is scarcely necessary to mention the vast fertile tracts on the *western waters*, as capable of producing immense quantities.

The State of Maine has a soil and climate, that appears highly congenial to flax culture. The extensive tracts of strong carbonaceous soils, particularly those denominated "*black lands*," and the almost total absence of drought, will enable that state to possess a staple in this article, not inferior in value to any, except grazing, whenever the energies of her population shall be directed to it. The rest of New England, that part of New-York not included in the first

description, and New-Jersey, have bodies of land suitable for flax, quite sufficient to be embraced in the system of agriculture best adapted to their situation. Pennsylvania probably grows more flax than all the other states in the union.* The Atlantic sections of the states, south of the Delaware to the cotton latitude, possess considerable tracts of alluvial soils, bordering on the numerous rivers, creeks, bays and inlets, with which they are intersected; a portion of them, besides swamps, may be reclaimed without great expense; they have also bodies of strong clays. Should these be too much exhausted by severe cropping, they may soon be restored by the admirable clover system adopted by Col. Taylor of Virginia, and made to produce good flax; as it is probable, from the early period the ground may be sown, that the crop would be seldom injured by the droughts, to which the climate is subject.

The soils which rank first in this country are the fat bottoms, that are covered by the fall and spring floods which subside early enough in the season to get in a crop; those river flats on the second banks, that have a depth of strong alluvial soil; the reclaimed marshes and swamps with a black unctuous soil, not too peaty, with as much clay in the composition as will permit its being rendered soon dry and mellow, and not retain water on or near the surface; if it stands two feet below, so much the better, but must be well guarded by ditches and dykes against sudden freshets. Such is the soil of the province of Zealand, where more flax is raised, and of better quality, than in any other part of Holland. The next in estimation are the strong black loams on clay or hard pan, that will retain moisture. Yellow loams, with a holding subsoil, may be rendered suitable for flax by proper cultivation; and since the discovery that plaster of

* By the returns of the Marshals in 1810, there was manufactured in the United States $300,000 worth of *Linseed Oil*; $500,000 of which was made in Pennsylvania, and $200,000 in New-England.—See Cox's Statement.

paris is an excellent manure for it, a crop may be obtained with much more certainty on lighter lands than formerly. Perhaps the characteristic of best *garden mould* may be applied to a flax soil, viz. *retaining sufficient moisture, and all that falls, without ever being saturated;* but on any soils the surface should be completely pulverized, and never worked when wet.

MANURES.

No dung should be applied to the land when the flax is sown, but may be put on bountifully with the previous crop. The objection is, that dung forces the growth so rapidly that the plants draw up weak, have a thin harle, and are more liable to lodge. Lime, marle, shells, leached ashes, &c. do not produce such effects. *Top dressings*, soon after the plants appear, of plaster, ashes, soot, &c. are highly beneficial, as they not only encourage the growth, but are a protection against *worms* which sometimes attack the young plants, and may be considered the only enemy they have, except weeds.

Salt has been mentioned by the late Dr. Eliot, of Connecticut, as an excellent manure to plough in with flax at the rate of five bushels to the acre;* probably more would be better. Plaster is now much used in Duchess county, the best cultivated district in New-York, as a manure for flax, on which its good effects are as apparent as on corn.

The late chancellor Livingston viewed a piece of flax on the 20th of May, 1791, belonging to a poor tenant, very injudiciously sown on a dry sandy declivity, it looked so extremely sickly that the tenant thought of ploughing it up; the chancellor gave him three bushels of *Plaster*, which was sown the next morning before the dew was off, and had the satisfaction of seeing his tenant gather more flax from this half acre in an uncommon dry season, than was produced from any acre in the neighbourhood.†

* See Eliot's Essays on field husbandry.

† Transactions of Agr. Soc. New-York.

PREPARATION OF THE LAND.—It is not unfrequent in Ireland to obtain crops of flax from green sward, on which they put lime, shells, limestone gravel, &c. and break up in the fall, cross ploughing and harrowing fine in the spring; but it most commonly succeeds a crop of potatoes which receive the manure. In Flanders, *Hemp* was formerly more used as a preparation for flax than since the introduction of potatoes. In Italy it commonly precedes flax, and although the land gets no tillage, as the hemp is well manured it grows strong, and is then a powerful destroyer of weeds. In England, on some of the *fen soils* of Lincolnshire, &c. the usual course is *hemp* two or three years in succession, well manured, then flax without manure; a crop of *turnips* is often taken the same season after the *flax*, and *hemp* succeeds again. In Russia it is said that extensive crops of *flax* are drawn from new cleared lands after burning them over, and harrowing in the seed with the ashes. The best preparatory crops in this country, at present, appear to be *potatoes*, *corn* and *roots*; they will most generally repay the extra manure, and if well managed check the production of weeds.

The following *rotations* may serve as an outline subject to be varied, and *hemp* or other crops introduced as circumstances require, viz.

No. I. LOW, COLD OR RECLAIMED SOILS.

1st year. *Potatoes.*
2d do. FLAX with seeds.
3d do. *Herds grass* and *red top* or *tall meadow oat grass*, to continue three years or more, and the course repeated.

No. II. STRONG UPLANDS.

1st year. *Potatoes* or *Corn.*
2d do. *Corn* or *Roots.*
3d do. FLAX with seeds.
4th do. *Clover.*
5th do. *Orchard Grass* or *Herds Grass*, to continue three years or more.

No. III. Light Lands.

1st year. *Potatoes* or *Corn*.
2d do. *Corn* or *Roots*.
3d do. Flax with clover seed.
4th do. *Clover*, to be mown once the after growth to be turned in and *Rye* sown thick on the furrow, which may be soiled or fed in the spring by sheep or milch cows, and ploughed in for
5th year. *Corn*.
6th do. *Spring Wheat* or *Barley*.
7th do. *Clover* and the course to be pursued as before, when flax will occupy the land every seventh year. In all cases, except when hemp is substituted, the tillage crops should receive the dung.

If the land is ploughed into beds, or convex ridges like turnpike roads about a rod wide, especially if low and level, the crop will be much more secure from injury by heavy rains, and the grass crops will be better if it remains in that form. On any soils, fall ploughing in narrow ridges will facilitate its early working in spring, and should not be dispensed with.

ESSAY III.

Weeding is considered in Europe, and by good husbandmen in this country, as necessary to secure a good crop of flax, which is a very tender plant when young, and more easily checked in its progress by weeds than any other. It is not supposed to be injured by the clover and grass sown with it: on the contrary the *Flemish farmers* think them beneficial, by protecting the tender roots from drought, and keeping the weeds under. It should be carefully wed when the plants are three or four inches high; they are not then injured by the labourer going barefooted over them.

CHOICE OF SEED.

That of the last years growth should be obtained if possible. The usual marks of good seed are, that it be plump,

oily and heavy, of a bright brown colour, sinking readily in water, and when thrown into the fire to *crackle* and *blaze* quick. A very simple method of trial is to sprinkle it thin between two pieces of wet paper, which plunge in a hot-bed or dunghill, and in less than twenty-four hours the proportion that will vegetate can be discerned, which should be ascertained in order to regulate the

QUANTITY TO BE SOWN.

On this head no particular directions can be given, as it depends on the various qualities of soil, goodness of seed, &c. The rule for seeding small grains is *reversed*; flax requiring to be sown thickest on rich soil, as not more than one stalk is wanted from a plant. In England and Scotland, never less than two, or more than three bushels to the acre is sown. Two and an half is the most usual portion. In Flanders and Ireland seldom less than three bushels are sown, except when seed is an object. Thick sowing is to obtain fine flax. In this country it will be important, at present, to sow at such a rate as will insure good crops of each; and experience only can determine the exact point.

If sown very thin, too many lateral branches will be thrown out; each producing a boll or pod affording more seed, but shorter and inferior flax. If sown too thick, the plants will draw up *weak*, with a single boll on a plant, and, subject as our climate is to heavy showers and thunder gusts, very liable to lodge; one of the greatest dangers a flax crop has to encounter. The commissioners for promoting flax culture in Scotland, considered it as practicable, and strongly recommended that the system should be so conducted, as to obtain good flax and good seed at the same time. It is so viewed in Ireland, among the more extensive cultivators, except when wanted for *fine linen*, *cambrick*, *lawn*, &c. Dr. Deane, in the "New-England Farmer," a work of great merit published some thirty years since, when flax culture was more attended to than at present, recommends from *six* to *seven* pecks. It is probable that *six* pecks is the least, and *two* bushels the extent that should be sown to obtain the

most profitable results, till the demand for seed is considerably lessened.*

SOWING.

The seed should be got in as early as it is possible to prepare the ground. Dr. Deane observes that a slight frost after the plants are up will not injure them. For no crop is it more important that the seed should be equally distributed. Fortunately what has long been a desideratum is now attained. A machine for sowing *small seeds broad cast*, with perfect regularity, great expedition, and in any desired quantity, has lately been invented, and performs to great satisfaction.†

PULLING.

This should be performed as soon as the leaves begin to fall, and the stalks shew a bright yellow colour, and when the bolls are turned a little brown. The seed will continue to ripen afterwards. When the flax is lodged it should be pulled immediately, *in any stage of its growth*, or it will be entirely lost; great care is requisite in sorting the different lengths and keeping them separate till after the flax is hackled or much waste will ensue in that process.

SAVING SEED.

As soon as the flax is dry enough to put under cover, the bolls should be *rippled*, as it is termed. A comb resembling

* The demand for *Linseed oil* must increase with the population for some time to come, as there appear no indications that the PEOPLE will forsake their *household deities*, CLAPBOARDS and PAINT, 'till the soil is much more denuded of its timber; even in those districts where the roads and fields are encumbered with suitable materials for permanent, *cheaper*, and more elegant buildings.

† Bennett's Machine for sowing broad cast, a description and drawing of which is given in the Memoirs of the Philadelphia Agricultural Society, vol. 4. with ample testimony of its usefulness. It is pushed forward by a man like a wheel barrow, and will sow more than one acre in an hour, unimpeded by wind or light rain. They are for sale at Harrison & Earl's Repository for Agricultural Implements in the city of New-York.

the head of a rake but with teeth longer and nearer together, made of hickory or oak, is fastened upon a *block*, and the flax taken in parcels no larger than the hands can firmly grasp, is drawn through, and the bolls rippled off; attention to sorting at the same time should be continued. The bolls are to be riddled and winnowed immediately; spread thin on a clean floor or on sheets in the sun, and when sufficiently dry and beginning to open, threshed. By this method the *foul seeds* are completely separated with little trouble, and good clean seed is ready for an early market, often the best, without the use of expensive machinery to make it so. Here the operations of the farmer ought to end! The PROCESS OF PREPARATION being foreign to, and unconnected with his other pursuits; and which has been the greatest objection to extensive flax culture. Can there be any reason why the farmer is to prepare his *flax* more than the *hides* of his *cattle* which he sends to the tanner? They are both chemical processes; and to dissolve the glutinous or resinous substances by which the fibres are attached to the stem without impairing their strength, is perhaps as *critical* and requires as much care and judgment, as to extract the animal juices from the hides, and fill the pores with *tannin!* In short, the flax *grower* and flax *preparer* and *dresser* should be distinct professions. They are said to be so in Flanders and Holland, and were extensively so in Scotland, where the farmer sold his flax on the ground, or in sheaves at his barn or rick.

The preparation of Flax by steeping is very general in the great flax growing countries in Europe, but it is not quite finished in the water. It remains spread some days on the grass, which is necessary to render it soft and give that *silvery* appearance so desirable. The destructive process of *dew rotting*, is most commonly practised in this country, and when water is resorted to, it is at an improper season, and the process imperfect; which is the cause of its being so *harsh* and *brittle*. Perhaps no part of the system requires

such an allowance for difference of climate. In the humid atmosphere of Ireland, it is not very material when it is spread, but in this climate, when exposed to a July or August sun, every *drop* after a shower, becomes a *burning glass*, and literally scorches the fibres; besides, such a highly putrid fermentation as will then take place in the water, though it separates the harle more speedily, not only injures it, but communicates a *stain* that renders the process of bleaching much more tedious and expensive.

The flax should not be put into the water till about the first of October, and remain from 10 to 14 days, according to the temperature of the weather, and should be taken out before the fibres will separate freely, spread on the grass when the frost will very much assist the operation, and the flax exhibit a *gloss* and *softness*, that it is impossible to give it otherwise. The following method of preparing hemp will apply with great force to the point under discussion. During the late war an experienced ship-master in Connecticut, and who was also a good farmer, raised a crop of HEMP. As soon as it was dry enough to be stowed away, it was put under cover and remained till October; was then put into clear soft water, till the fibres would separate with some difficulty, when it was spread on the grass; the frost completed the operation, and when dry it was immediately secured. There was no putrid fermentation to deteriorate the harle, nor was it mildewed by being exposed to the weather, and when dressed, exhibited that fine *silver green* hue by which the best Russian Hemp is distinguished;* and when *worked up*, was pronounced by the rope-makers to be equal to any hemp ever imported! Here is a lesson for our *western brethren*, that is worth more to them than *real* mines of silver. *Clear*, *soft*, *stagnant* water is preferred in Europe. A canal, forty feet long, six broad, and four deep, is said to be sufficient for the produce of an acre of flax, at one time.

* The best *Riga Hemp*, supplied for the British Navy, is prepared by steeping; during which it is shifted three times.

It should be formed on a clay or some holding soil, where the water from a spring or brook can be conducted in with convenience, the expense would not be great, and on most farms suitable sites may be had. May not boiling or steaming be found the most advantageous process of preparing flax? The very superior sample of thread exhibited at Brighton in 1818, for which Mrs. Crowninshield, of Danvers, received a premium, was spun from flax prepared by *boiling!* It appears by the "transactions of the Swedish Academy," that a method was practised in Sweden, of preparing flax to resemble cotton, by boiling it ten hours in salt water, spreading on the grass, and frequently watering, by which it becomes soft and bleached. Boiling or steaming will not appear very formidable or expensive when we examine the subject. A *box* twenty feet long, six feet wide, and four deep, well constructed with stout plank, a *boiler* from which a large *tube extends into, and communicates with* the water in the box, will boil the produce of a quarter of an acre in a day, that is, if we allow double the room to boil in that is required for steeping. A steam pipe instead of the tube, and having the top of the box well secured, would permit the process of steaming to go on. It is probable that by either method, *grassing* will be necessary to obtain soft flax. The yarns of which the sailcloth is made at Paterson, are all *steamed.* The navy board expressly forbid their being boiled in an alkaline lye, as is usual in most manufactures of linen. It is from this precaution that their canvas has the pliable, oily feeling, which so much recommends it. It should not be lost sight of, that by boiling or steaming much time and expense will be saved in bleaching.

We arrive at the final process, DRESSING, and in this our climate gives a decided advantage over Ireland, Flanders, or the north of Europe, where the flax is dried on hurdles, over a peat fire in ovens or kilns, requiring great care in regulating the heat to prevent injury. All this trouble and hazard is obviated by our dry atmosphere and keen north-west winds. Dr. Deane

estimated the expense of dressing flax by hand at one third the product. I believe the present price does not much vary from his estimate. A respectable gentleman from Dutchess county, New-York, informed me, that mills or machines impelled by water, have been erected there, that break and completely dress the flax for a toll of one tenth! It is said one or more of them are in operation in the western part of this state. These mills were invented in Scotland, and are now said to be brought to great perfection. They are erected in all directions, in the principal flax districts in Ireland, and notwithstanding the low price and limited demand for labour, are resorted to by the poorer classes of people, the dressing by hand being mostly abandoned. There are machines in England that dress the flax immediately from the field, *without any preparation whatever*. An account of them may be found in the 5th vol. of the Massachusetts Agricultural Journal. It appears, by the report of a committee of the House of Commons that in 1817, they were in successful operation. A man and three children impelled the machines and dressed sixty pounds a day. We have no information of any further improvements. Should they be susceptible of the application of water or steam power, in any degree proportionate, the advantages may be incalculable, but, in the present enquiry, we place these machines, however desirable, entirely out of the question.

PRODUCT.

It is not uncommon in Great-Britain and Ireland to obtain eight hundred pounds of flax from an acre! Six hundred pounds is estimated, in some districts, as an average; but it should be observed, that little, if any, seed is obtained. The average crop in New-England, as far as our information extends, cannot be estimated at more than two hundred pounds, and six or eight bushels of seed. (We do not include the rich bottoms on the Connecticut and some other rivers.) Dr. Deane was of opinion that four hundred pounds might be calculated on with proper management.

We think that four hundred pounds of good clean flax, and eight or ten bushels of seed, may fairly be assumed as a medium crop on favourable soils, where the culture becomes such an object as to make other farming operations subservient to it, and due attention is paid to change of seed.

Those who grow flax to any extent are of opinion, that the seed, at the price it has been for some years past, pays for all the labour bestowed on the crop to the time the flax is ready to be prepared or rotted.

If we are correctly informed, flax of a fair quality cannot be imported from *Ireland* for less than *fourteen cents* per pound. And the price of the best of *Russia* flax delivered on ship board at St. Petersburg, is ten and an half cents per pound. The quality called "twelve-headed" costs nine and an half cents on board.

The quality of flax raised in this country varies more than any other product; and of course the price, which is from six to eighteen cents. The medium about ten cents per pound.

It must be acknowledged, that no great exertions can be expected in the pursuits of any people, till "the prospect of reward *sweetens their labour*." And I anticipate the question that some may be disposed to ask, before they have finished the perusal of these essays, "Where is the farmer to find a *market*, if flax is extensively cultivated?" We will ask where could the *planter* have found a market for his cotton if machines had not been invented for spinning it? And how could he have supplied it, if the labour of two thousand hands had been required to clean it of the seeds, that is now performed by the *Cotton Gin* invented by Whitney? We have shown that the expence of dressing flax has been reduced from one third to one tenth of its value;* and it is a fact well established, that there are now in the country, machines for spinning *flax*, that perform as well, and more ex-

* The usual toll for ginning *Cotton* in *Alabama*, we are informed, is one-twelfth.

peditiously, except for the finer threads, than those for spinning cotton! The Paterson *sail cloth* is fabricated entirely from *yarns* spun and twisted by machinery, assisted by as little manual labour as Cotton machines. In those manufactories are *six hundred* spindles. In the state of New-York and in Pennsylvania about *three hundred* more are employed for *sewing thread, sheetings, bed-ticks, shoe thread, twine*, &c. The expence of labour, after the flax is hackled, in attending a machine of twenty-four spindles for spinning common shoe thread, is *thirty-three cents* per day, spinning on an average twenty-four pounds a day, or one pound a day for each spindle! equal, it is said, to the production of a cotton spindle for five or six days!

Can any thing be wanting but the application of POWER LOOMS for weaving linen, to place the manufacture nearly upon an equality with cotton? And is there any doubt but they can be so applied?

The perfection of cotton spinning machinery, and the invention of power looms, with such improvements as are exhibited at Waltham, it is well known are about to produce an entire revolution in the India trade! If they can stop the *spindle* and the *shuttle* of the HINDOO, who is supported upon a handful of rice a day in a climate where little is required for cloathing or shelter, what must be the effect of machines of similar operation in the *linen manufacture*, upon the RUSSIAN and the GERMAN? There is probably at this moment, a million tons of American shipping cloathed with Russian canvas! What, but the raw material of *good quality*, is required to elicit CAPITAL, to manufacture in our country sufficient for this supply immediately, and in a few years even to compete with European nations in the linen market?

The exportation of linen from Germany to North and South America has been, and is at present, of vast amount! The single province of Silesia has sent in one year to Hamburgh and other ports, linens to the value of nearly five

millions of dollars to be shipped, by the circuitous route of Cadiz, to the Spanish colonies. These customers are at our doors. The United States possess the "GOLDEN GATES of this Commerce," and with exertions well directed to her agriculture, Europe will be obliged to surrender the keys.

Brighton, 27th March, 1821.

BENNETT'S MACHINE FOR SOWING BROAD CAST.

Roxbury, 5th May, 1821.

DEAR SIR,

HAVING for some time past thought of cultivating a patch of flax, I was more fully determined so to do in consequence of the essays on that subject, read by you before the board of trustees, at their last meeting.

My friend E. H. Derby, Esq. of Salem, having recently purchased one of Bennett's Machines for sowing broad cast, has been so good as to lend it to me, and with which I sowed my flaxseed, one and an half bushels on one acre and a few rods of ground, on the 25th of April, after having harrowed in clover, herd's grass or timothy, and red top seeds, sown also with the same machine; the ground was again harrowed lightly and rolled, and the flax on the 2d May (only eight days after sowing) made its appearance, coming up very handsomely, and I think much more regularly than it could possibly have been sown by hand; it is not at all in rows, as might be presumed from the appearance of the machine, but, by the shape of the brushes which throw out the seed, it is completely broad cast.

I have also, on other lands, sown ten acres of clover, herds grass and red top seed, and clover and orchard grass, which are making their appearance and look finely. The quantity of seed may easily be regulated from *one pound to two bushels per acre*, and can be extended. My man, with great ease, sowed an acre in less than an hour. On the

whole, I think this one of the most valuable implements ever introduced into this state for agricultural purposes.

The Flaxseed which the society have sent for to different parts of Europe I hope will arrive in season for the next year, and I trust will be a great acquisition.

Believe me to be, dear sir,
respectfully, and with esteem, your's,
JOHN PRINCE.

S. W. POMEROY, Esq.
First Vice-President of the Massachusetts Society for promoting Agriculture.

ON PRESERVING POTATOES FOR SEA STORES OR FOREIGN CONSUMPTION. By Mr. CHARLES WHITLOW, of Canada.

[From the Transactions of the Society of Arts. Vol. 33.]

SIR,

THE usual mode at present practised for endeavouring to preserve potatoes, is to leave them, after digging, exposed to the sun and air until they are dry. This exposure generally causes them to have a bitter taste, and it may be remarked, that potatoes are never so sweet to the palate as when cooked immediately after digging. I find that when potatoes are left in large heaps or pits in the ground, that a fermentation takes place which destroys the sweet flavour of the potatoes, in order to prevent that fermentation, and to preserve them from losing the original fine and pleasant flavour, my plan is (and which experience proves to me to have the desired effect) to have them packed in casks as they are digging from the ground, and to have the casks, when the potatoes are piled in them, filled up with sand or earth, taking care that it is done as speedily as possible, and that all vacant spaces in the cask are filled up by the earth or sand; the cask thus packed holds as many potatoes as it would was no earth or sand used in the packing; and as the

vacant spaces of the cask of potatoes so packed are filled, the air is totally excluded and cannot act on the potatoes, and consequently no fermentation can take place.

I sailed from New-York to St. Bartholomews, and brought with me two hundred barrels of potatoes, packed in the above manner.

On my arrival at the island I found, as I expected, that the potatoes had preserved all their original sweetness of flavor; in fact, as good as when first dug, having undergone no fermentation, nor in the slightest degree affected by the bilge or close air of the ship. Some barrels of the potatoes I sold there, and at the neighbouring islands, for four dollars per bushel; and at the same time potatoes taken out in bulk without packing, and others that were brought there packed in casks which had not been filled up with earth, sold only for one dollar per bushel, they being injured in the passage by the bilged air and fermentation, being bitter and bad, whilst mine were as perfectly sweet and dry as when dug: what remained I shipped from St. Bartholomews to Jamaica, where they arrived in equal good condition, and sold at a higher price than they had brought at the former island; some of these casks of potatoes were put in a coal cellar by the purchaser at Jamaica, and on examining them when I was leaving the island two months after, I found that they had in a very small degree sprouted, but that all their original flavour was preserved. CHARLES WHITLOW.

London, New-York Coffee-House, Feb. 12, 1816.

To C. Taylor, M. D. Sec.

[The communication of H. B. Way, Esq. printed at page 45, of the present volume, on the preservation of carrots during the winter months, is a confirmation of the plan proposed by Mr. Whitlow, for preserving vegetable roots a long time fit for food.]

REMARKS ON SOILING.

[Communicated by Hon. Josiah Quincy, and continued from page 125.]

Conformably to my promise, I proceed to state the manner in which the soiling process ought to be conducted, by any one, who may originally attempt it; how far it is applicable to the farming condition of New-England; and what species of farmers will find their account in attempting it.

As to the manner in which the soiling process ought to be conducted, besides that general care and personal superintendance, (at least occasionally and by way of oversight) which is essential to success in this, as in every other business in life, three general objects ought to claim the attention of every farmer, or other person, who undertakes this process.

1. Provision against seasons of extraordinary drowth, or deficiency of general crop, from any other natural accident.

2. Succession of succulent food, during the whole soiling season; and facility of its attainment.

3. Preparation relative to care of the stock, and increase of manure; the particular objects of the soiling process.

As to provision against seasons of extraordinary drowth, or deficiency of general crop from any other natural accident, I make this suggestion from respect to an obvious dictate of prudence, rather than because such has been my own practice. In fact, I have never made any such provision. Years of uncommon drowth, or sterility from other causes, are so uncommon in our country, that I have, hitherto, neglected, and without injury, this plain suggestion of prudence. As a general rule, however, a farmer, commencing and adopting this plan, would act wisely, to keep on hand, a month, or six weeks stock of hay or other food; so as to have assurance that his cattle should not suffer from any untoward accident of season. A mixture of dry food, with the succulent, is often very conducive to the health of the animals soiled, and enables the feeder to check the too great loos-

ness of the bowels; often the effect of high feeding upon succulent vegetables.

Some provision of dry food, against such exigency, and for such purposes, is wise, as a dictate of foresight. It is also as a dictate of economy, as some mixture of dry food with succulent, makes the latter go much farther; and, on very stormy days, enables the feeder to preserve the general and desired state of the cattle, soiled, with less personal exposure.

As to the second general object of attention, succession of succulent food, during the whole of the soiling season; and facility of its attainment. This includes

1. Nature of the crop used for soiling.
2. Time and mode of sowing and cultivation.
3. Mode of taking and applying the crop, and the relative location of the ground, used for soiling, to the place where the cattle is soiled.

1. As to the nature of the crop used for soiling. This must, of course, be different, in different climates. The English speak of lucerne, clover, peas, cabbages, as used for this purpose. Of all these, clover is that, which is the most capable, in this country, of being made useful in this system. Unquestionably, however, any succulent vegetable, which cattle consume, may be used, according to the discretion, which acquaintance with its nature dictates. Without dilating generally on the applicability of all of these vegetables, and leaving every farmer to take advantage of these and every other, he may deem useful, and find convenient, I shall state my own practice and experience.

These have led me to simplify and reduce the number of vegetables used, for the purpose of making the cultivation and effect of each species selected, a distinct subject of consideration; and for the enabling me to have the great supports of the system well established. This effected, it is easy to change, and to deviate, into other vegetables, or to introduce them in aid of those, on which any one chooses

principally, to rely. In making my selection, I was guided by the nature of the climate, and by the consideration of the vegetables selected being the best known, and most successfully cultivated in the neighbourhood. I use but four,—1st, grass; 2d, oats; 3d, Indian corn; 4th, cabbages.

1. Grass. I depend upon this for the first month of the soiling season; beginning, in our climate, about the 20th of May, or 1st of June, and terminating about the 1st of July.

In my own practice, I have contented myself with commencing soiling at the time, at which cattle are in this climate usually turned out to grass. It would be wise, and, I apprehend, easily practicable, to introduce some vegetable, which, sown the preceding year, would enable the farmer to commence cutting earlier, and so carry back the commencement of the soiling season to the 1st of May, possibly earlier. This, however, I have never attempted, partly because it required personal attentions, which, I could not give, consistent with my other avocations; and partly because, in the commencement of the system, I thought it wise to limit my experiments to the period, in which cattle are usually kept upon pasture; leaving it to future experience to enlarge the benefits and length of the soiling season. Fearing lest by attempting too much, I might be discouraged, and by failure, in part, might put to hazard the great objects of the system, which are attained, when vegetables taken for soiling are made a complete substitute, for vegetables fed by the cattle themselves from the pasture. For the first month, therefore, of the soiling season, I depend upon grass.

Concerning the quantity of land, in grass, necessary to be applied to the support of any specific number of cattle I have no experience sufficient to state it with accuracy. My own practise has been to cut from the earliest grass I could find, in small pieces and patches about my house, and by sides of an inclosed road, of which I could not easily take an exact measurement. Minute calculations on this point must

obviously be very uncertain and unsatisfactory, as the capacity of every given piece of land, to support any specified number of cattle must depend upon its heart and state of cultivation. It will be sufficient to say that my own experience authorizes me to state, that one acre of good clover, or any early grass, cut for soiling, is ample for the support of six head of full grown cattle, from the 20th of May to the 20th June. As it is best, however, in all calculations of this kind to provide against all contingencies, my rule is to consider *one quarter of an acre* of my best grass producing land as appropriated to each head of soiling cattle, for its support between the 20th May and 1st of July. Less than that quantity has always been sufficient on my farm. If it be not used for soiling, the produce is housed as hay, for the winter.

Small farmers, who should top dress the land every day cut over, with the water leached from the manure heap, would reduce the extent of land required for the process of soiling very considerably.

It is needless to give any directions relating to any particular preparation for the soiling process, for this first period. What is required is only land in its best grass state,—good mowing land,—to be reserved at the rate of a quarter of an acre, for each head of cattle soiled, and for the facility of feeding and of manuring for after feed as near the barn, where the cattle are kept, as possible.

The preparation of oats, Indian corn, and cabbages, require somewhat more particular attention.

Preparation of soiling food in April, for July. 1st. of Oats. These are, on my farm, made to succeed grass, and usually afford a good cut about the first of July. As it is important in every plan of husbandry, to simplify as much as possible, I shall consider oats, as the food exclusively destined for the month of July, although, in fact, at the latter part of the month, Indian corn stalks may begin to be cut; and had often better be commenced, not only for the sake

of diversifying the feed of the stock, but because, the corn stalks cut in the latter part of this month will be more likely to vegetate anew with luxuriance, than if cut later.

With this explanation, I state oats, cut in the milk, to be the food, in this climate, for the support of the soiling process, in July. As it is important to get the cattle off of the grass land as soon as possible, to the end that the winter crop of hay may be the more abundant, so the preparation for oats ought to be as early as possible. It will be best, if the land have been thoroughly ploughed the autumn preceding. It ought to be land in excellent heart, all my calculations being made on land in such a state. It being obvious that calculations on any other must be altogether uncertain and various in result. It ought also to be land, which had been cultivated and well manured the year preceding. As soon as the frost is out of the ground it should be ploughed at least once, and the oats sowed broad cast, at the rate of four bushels to the acre, at least. The land should then be harrowed and rolled. Oats thus sowed, at the earliest moment possible, will generally be ready for the scythe by the first of July.

As to the quantity of land thus to be prepared, one acre, for every four head of cattle soiled; that is, one quarter of an acre for each head, will be sufficient. At least such has been invariably my experience, where the land is in proper heart and tilth. In order to test this point, I have not only observed and compared the general extent of land cut over, with the whole number of cattle soiled, but also have more than once had the quantity eaten by a certain number of head, in a certain number of days, on a measured extent, compared. The result of my experiment is, that *one square rod of oats, in full milk, growing on land in proper (that is, high) tilth will support one head of cattle a day.* One quarter of an acre, or forty square rods, for thirty days, is a fair basis of calculation, and making a sufficiently liberal allowance for accident.

In the outset of attempting this system, I should recommend somewhat enlarging this quantity, that is, sowing somewhat more than a quarter of an acre, for every head of cattle soiled.

1st. Because in farming as little should be left to chance as possible.

2d. Because nothing is lost; if there be an excess, it may be cut and dried for winter food.

3d. Because the necessity for beginning to cut a little before the oats are in full milk, and sometimes of extending the cut a little after that period, will affect the general result of all calculations relative to the productive power of the land.

In reference to the fact, and upon the supposition on which we are now proceeding, that oats alone, without aid from any other product, are relied upon for the whole month of July, the sowing ought to be successive, viz. one half the destined quantity of land, as early as the seed can be got into the land; the other half, a fortnight later, so that the crop may have some succession. It would be probably better if the whole extent destined were divided into fourths, and sowed each fourth with a week or ten days intervening. Thus supposing the number of cattle soiled to be four; requiring one acre, according to my practice; and one quarter should be sowed on the 1st of April, one quarter on the 8th, one on the 15th and 22d. My own practice has not been thus subdivided. I have found one sowing about the 10th, and one about the 15th to answer.

2d. Indian Corn. This, according to that simple plan, of conducting the soiling process, I am describing, is to be relied upon for food during the month of August.

The estimate made concerning the capacity of land in oats, to support stock, may for all practical purposes be assumed to be the same, when in Indian corn; that is, a quarter of an acre to support one head for the month. Somewhat more than that quantity to be sown per head, for the

same reasons as those stated in relation to oats; the land to be in the same heart and tilth; to receive, at least, one ploughing, and harrowing, about the latter end of April and in the beginning of May; after which light furrows should be run three feet asunder, at the depth of three or four inches. In these furrows corn should be sown broad cast, about the thickness, and in the same manner, as peas are sown, in field culture of them. The corn may then be covered by the plough. Although, in my experience, a harrow drawn lengthways, and then crossways, followed by a roller, is sufficient, and to be preferred for this operation.

If the farmer choose, and his fund of manure permit, the furrows, previous to planting, may be lightly strewed with manure, to obvious advantage. This, however, has not been my practice. Grain of any kind, not permitted to seed but little, exhausts the land; but if it be repeated it will require, of course, some provision of manure to prevent its deterioration. He, however, who carries on a soiling system, upon any important scale, will never want for manure.

Corn thus sown will be ready to cut the latter end of July and the beginning of August. The whole month of August, I have found Indian corn, cut in the stalk, the best soiling food. If, however, the farmer prefer to give a variety he may sow a part of the land in oats, instead of corn, and alternate through the month of August on oats and Indian corn.

In the middle of May, in the beginning and middle of June, and even as late as the first of August, in our climate, a portion of land proportionate to the number of cattle should be sowed in like manner; on which soiling may be continued during the whole month of September. In this month, however, reliance may be placed upon the grass of the second crop, from those acres from which soiling was effected in the month of June. The grass of the second crop will generally enable the farmer to soil to the 15th of October, if his grass land be in proper tilth and heart.

After the 15th of October to the beginning, or the middle of November, the tops of his winter vegetables, such as carrots, or turnips, and which, in every good system of farming, should be raised in proportion to the stock kept, should be relied upon.

After which cabbages should succeed until the time when all cattle are housed in this climate.

Reduced to a single statement, my experience and system, is, for the support of my soiled stock during the months of July, August and September, to sow, in the months of April, May, June and July, equal to three quarters of an acre of land for each head of cattle soiled, in such succession as will give also a regular succession of succulent food, in the three first mentioned months.

For their support from the 20th May and during the month of June, I reserve early clover or other grass, at the rate of one quarter of an acre for each head of cattle soiled.

For their support during the first half of October I depend upon the second growth of the half acre, cut over in May and June, and the second growth of the oats and corn cut over in July.

This period, between the 20th May and the 15th October is the only one on which I rely on grass, oats, and Indian corn; and includes a reservation and employment of land, equal to one acre per head of cattle soiled.

My own experience has been always less than this. Never having exceeded, as I believe, seventeen acres for twenty head; and those, never in that state of high tilth, which in this systematic statement I recommend.

In truth, the capacity of an acre to maintain cattle, in a soiling process, if conducted with due attention to develope its full powers, is probably four, or five times greater than this, but I choose to raise no extravagant expectations. In the commencement of every new system, mistakes will be made. Great diversities in quality or state of land must

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exist, and will, of course, occasion a diversity in result. Besides, the soiling process, beyond all others, requires vigilance, and foresight. Cattle, in this process, are not left to range over an immeasurable extent of pasture, composed of grass, heath rock, marsh, brush and briar, about which the owner makes no calculation; sometimes stocking it beyond, and sometimes beneath its power; in good seasons keeping them well, in bad affording lean and scanty fare, scarcely sufficient to support life, and wholly inadequate to a profitable return. In the soiling process they are put under the care of intelligence. It must exist and must be exercised. If this be the case, the reward from the system, on farms suited for it, is ample. For myself, after a trial of six years, no consideration would induce me to change it for the old method of pasturing.

It remains to explain the soiling system during the residue of the season, viz. from the 15th of October to the middle or the latter end of November; at which time stock, in this climate, usually begin upon their winter food. In my system, I have depended upon the tops of carrots and turnips, destined either for the market, or for the winter food of stock. My practise has been to raise from eight to twelve acres of vegetables. The tops of which, with a single foddering of salt hay, per day, have been, according to my experience, sufficient to support, equal to twenty head of cattle from the 15th of October to the middle or latter end of November.

If, however, the farmer is not in the practice of raising a sufficient quantity of roots, to yield a support for his stock, for six weeks, cabbages are, in this climate, the farmer's best dependance; after the second cutting of the grass, and corn, and oat fodder, fail.

The preparation for cabbages, in field culture, is so well and universally known it needs no explanation. It is sufficient to say that, in suitable soil, well manured, a thousand

plants, weighing, upon an average, fifteen pounds, may easily be raised on the eighth of an acre. These, at 200 lb. per day, per head, or 13¼ cabbages, will be sufficient for each head of cattle seventy days, which is ample for the support of each head, to the first of December.

With respect to care of the stock, and increase of manure; the particular objects of the soiling process. All the care of the stock, requisite, is keeping them clean, and currying them, every day; throwing the manure into the proper receptacle; seeing that the cattle are regularly and sufficiently watered; and that they be permitted to be at large in a yard, of a common barn yard size, at least two hours, in the morning, and two in the afternoon. The yard will be best if a part of it be shaded, or sheltered from the direct rays of the sun.

The food is distributed in racks, under cover, or in the barn, about six times a day, in due proportions, which the usual practical knowledge of a farmer will easily regulate.

A cellar under the barn, or at least a covered receptacle for the manure, clayed at the bottom, or stoned, so as to be water-tight, to the end that the drainings of the manure should not escape in the subsoil. The yard and floor of the barn should, also, be so constructed, as to direct the urine into such a covered, water-tight receptacle.

This is particularly necessary in the soiling process, inasmuch as the manure made by succulent food is rich, and watery, and liable to be in a degree wasted by the action of the sun's rays, in an open yard. But when under cover, it is the richest of all manures of like species, and is qualified beyond all others, to impart its riches to soil, and earth thrown into the receptacle, and mixed with this summer's manure.

Hogs, also, should be permitted to range into it from the hogpen, not only for the purpose of mixing the deposit together, but also on account of economy; in all soiling, some

waste of green food is unavoidable, either from sometimes cutting more than can be consumed in the day, or from its being blown upon by the cattle. This hogs consume and prevent loss of it.

The increase of manure in this mode exceeds all anticipation. It is on this account that the soiling process claims the attention of farmers, who are always ready to say, "We can do well enough, only give us manure. The want of manure is our great want." This is supplied by the soiling process, in a mode cheap, easy, within the resources of every farmer, and leading, in its event, to the highest and most satisfactory of all methods of conducting a farm.

I have been the more minute, in this statement, and shall not fail, hereafter, to communicate my experience, in this system, because I apprehend it is peculiarly suited to the farming condition of Massachusetts; and although it is, at present, almost unknown, and wholly unpractised; at least, I have never heard that it is as yet practised, upon any considerable scale, on any farm (except my own) yet I am satisfied that it will gradually grow into use; and the sooner, it can be made to be understood, and the way shown, the better for our commonwealth. A farmer, now-a-days, who has but thirty or forty acres of land, feels himself, in some measure, straitened for want of room. He is tempted to buy pasture ground; to widen his surface; perhaps to run in debt; and embarrass himself for life, for the sake, of what he thinks, the "*one thing needful*" for a farmer—*much land*. When his sons come of age, if he cannot give them more than thirty or forty acres, they must abandon their homes, the land of their fathers, and all the privileges of a cultivated and improved society to seek *a great farm* in western wildernesses.

Now all this is mistake and want of knowledge of the productive power of the soil, when highly cultivated. The first step for farmers to take is to reverse their old prejudices in this respect, and instead of calculating how much more

land they want, let them try with how little they can do; and do well.

There is no proposition in nature more true, than that any farmer may maintain upon *thirty acres, of good arable land, twenty head of cattle*, in better condition, with more profit, with more comfort to the animals, with less labour, less trouble, and less cash advance, to himself, than he at present usually expends upon a hundred acres. In addition to which he will have the great satisfaction of seeing, in time, every square inch of his land productive, instead of seeing, as he does now, not more than one part in four of his farm producing any thing; or at least any thing that will pay the expence of harvesting.

But how is this practice to be introduced? I answer. Gradually. Let farmers "feel their way" into it. If any farmer thinks that he wants more pasture land, in order to keep more cattle in the summer, in order to consume his hay, or to make manure, in winter, instead of running in debt, or laying out his money in more land, let him keep himself free of debt, or put his money out at interest; and try soiling. Let him be assured he will find his account in it. But how shall he try? Shall he shut up all his cattle at once; enter upon a scheme recommended by book writers; and perhaps fail, either from accident, or misapprehension, the first year. By no means. Every practical farmer, if he be wise, will, on the one hand, never utterly slight the suggestions of books and writers on the subject of his art; and, on the other, will never enter upon them, at once, on any great and decisive scale. As the saying is, "he will always feel his way." Thus, for instance, in this case of soiling. A farmer, ignorant of the subject, yet willing to try the experiment, should commence with one or two head of cattle. Let him set aside, at first, two acres of land for each head. Nothing will be lost if there be an excess of the oats, or corn, sown for soiling, beyond the consumption, the surplus

cut in season, will remain for winter's food. Let him go through, for one year, a course of soiling such as is suggested, for one or two head of cattle. Let him oversee the feeding himself; or by a confidential hand. A boy, if trustworthy, is sufficient for such an experiment, acting under the daily directions of his father, or master. Let him provide a pit, or cellar, covered, or under the barn, or so placed in relation to the cattle soiled, as that the manure and urine can be easily preserved; the cellar, or receptacle, being water tight; if this be so situated as that his hogs can have fair play among the deposits, it is impossible but that he will find his account in it.

One year's success will enable him, and, I cannot question, will induce him, to double, if not treble, his next year's experiment. Soon he will, if the nature of his farm permit, shut up his whole stock; and ultimately will arrive at a state of conviction and feeling, such, as will never permit him again, on any consideration, to allow cattle to run at large, on any of his land, which is capable of being ploughed and mown.

I know it will be asked what shall be done with rocky land, and land suitable only for pastures? My answer is, that where a man *has nothing else*, but rock or pasture land, or sand, which cannot be made subject to cultivation, a man must manage according to his condition. Good farming is making the most of land, according to its species. If a man has a sand bank, on the margin of the ocean, he will best make salt. If he have nothing but some perpendicular mountain rocks, he will best, probably, keep goats. So of the rest. Farming, to be good, must always have reference to the species and capacity of the soil.

The system I advocate has reference to *arable land; to that portion of it on every man's farm, which is capable of being ploughed, and mowed over.* Every man who wishes to make the most of this part of his farm, will effect this the

most certainly, the most economically, and the most satisfactorily by the mode I recommend. If a man have part pasture and part arable, he may soil for part, and pasture for part. There is nothing inconsistent in this; on the contrary, the soiling is a great support to the pasture; because when the pasture fails, as in dry seasons it often will, a man, who soils part, will always provide a surplus of his soiling food, to meet such a contingency.

In answer to the question, what species of farmers will find their account in attempting to soil? I answer. EVERY FARMER, WHO WANTS MANURE; AT A CHEAP AND EASY RATE. The greatest profit of soiling arises from the quantity of manure it enables the farmer to make; more than doubling it upon the same stock. It may be adopted, I apprehend, as an axiom, almost universal; certainly so, except in cases of very great proximity to a town or village, that soiling is the cheapest of all modes of obtaining manures. In this point of view, the saving of fence, the economy of land, of food; the increase of milk, and the better condition of the cattle; all of which have been shown to be the consequence of this method, may be considered as incidental to the system, as an offset for the labour requisite; giving the manure made as a clear gain; and what is more, without the loss and trouble, and expense, of carting from a distance. It is not only made, but it is placed, just where it should be, in the farmer's own stercorary—or, covered manure heap.

The rich farmer, and the extensive land holder, ought to avail himself of it; *if he wants manure.* Such farmer, if he have capital, may stock his pasture land up to its full pasture power, and keep a number of head additional on the soiling system, according to the quantity of manure, of which he stands in need. But the conduct of a farm, upon a great scale of this nature, depends upon so many circumstances, that the particular mode or extent of applying this system, as

subsidiary to pasturing, cannot be prescribed by any general rule. Calculations must have reference to a knowledge of all the particular circumstances and relations of such a farm, and such a capitalist farmer.

It is to small farmers, those who possess twenty, thirty, or forty acres of land, to whom this system is peculiarly applicable. Upon this they may build up a most prosperous agriculture, with little capital, little more than ordinary trouble, and little or no risk; relieved from debt, which is so frequently the farmer's ruin, under the idea of the necessity of purchasing more land, and relieved, also, from the pain and vexation of owning and superintending a vast surface; every where less productive than it ought to be, and in a very great proportion, often not productive at all.

I have, thus, endeavoured to give, according to the request of the Trustees, an account of the mode of my conducting the soiling process, and the result of my own experience. It is now six years since I commenced it, and no consideration would induce me to abandon it. Every year brings new conviction of its facility and its productiveness.

If small farmers, would be persuaded to commence the system upon a small scale, with one or two head of cattle, they would gradually become acquainted with it. Success would inspire confidence. Until enlarging the number of cattle soiled, they might, in time, easily keep one head per year for every acre of land they possess. Far greater than this, would be the fair, ultimate, result of the system, if wisely conducted. Besides which, they would find other economies and advantages resulting from it, amply compensating for all the increased labour consequent upon the process.

ON THE USE OF GREEN VITRIOL AND DILUTED SULPHURIC ACID, AS A MANURE.

[Communicated for the Agricultural Repository.]

To the Corresponding Secretary.

SIR,

SEEING in the last number of your Repository an article on salt as a manure, I beg leave to offer, for the consideration of farmers, the evidence I have been able to collect in favour of two other substances as manures, not, I believe, generally known among us as such, but thought to be deleterious. Massachusetts, in common with some others of the United States, abounds in the ore of copperas or green vitriol. In some parts of the commonwealth, I have observed many of the stones in the walls on the road side covered with an efflorescence of this salt, and the general appearance of the rock indicating a rich one. The colour of the stone is a dingy yellow, with here and there a blueish metallic shade. It may be readily known by the common farmer from its tendency to crumble when exposed to air and moisture, and from the white powder sometimes seen on its surface, and which has a sharp acid taste; wherever the loose stones of this species of rock abound, there probably will be found, at no great distance, ledges of the same. This salt is composed of oxyd of iron and sulphuric acid. The latter ingredient is supposed by some, to be the fertilizing principle of gypsum or Plaster of paris, and this opinion is strengthened by the fact that diluted sulphuric acid is known to have the effect of a manure. Others, again, contend that the chemical affinity of the acid for lime is so strong, that it cannot be decomposed by any thing it may meet with in the soil; but that it operates in its concrete form as a stimulus to vegetation. This is, after all, but matter of conjecture, and neither on the one side nor the other

will the knowledge at present possessed authorize any thing more conclusive. In some instances, when plaster applied to the soil has been found inert, a small quantity of stable manure, another season, on the same land, has produced an effect not to be accounted for from the stable manure alone. It has been supposed, that in these cases, the plaster which before lay dormant, was decomposed by something this manure contained, and that the increased activity of vegetation was the joint product of both. Some years ago, I saw on a farm at Borden Town, in New-Jersey, a substance which was there called *Marl*, and which had altogether the appearance of the pulverized copperas ore, which I had seen at Thetford, in Vermont. It was a blackish grey earth, and contained a considerable quantity of *pyrites* in small crystals. I witnessed its effect as a manure on a field of clover, which was remarkably luxuriant, while another adjoining part of the same field, to which it had not been applied, was far less thrifty.

A very large stratum of earth which formed the bank of the river (Delaware) for some distance was of this substance. That there was a considerable portion of the sulphate of iron or copperas in this earth, there can be no doubt; and that this constituted its fertilizing principle, may perhaps be fairly inferred from the following considerations.

Dr. Pearson, as stated in his communication to the Board of Agriculture in England [vol. 4. page 319], ascertained by analysis, that the salt of peat, which is sometimes observed on the surface of this substance, chrystalized and very white, was pure *sulphate of iron* or copperas.

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and on the absorption of certain powerful mineral substances into the organic system of vegetables. In numerous instances I have subjected the stems and leaves of plants, young and old, large and small, to the influence of the sulphates of iron and copper. I have found that both of these metallic salts are very greedily absorbed by vegetables, insomuch that I have detected the presence of iron in the vessels of a branch of mulberry, at the height of five or six feet above the place of immersion in a solution of the sulphate of this metal. Sulphate of iron applied to vegetables is a poison, like almost every thing else, only from the overdose. In several of my experiments, the branches of vegetables that were placed in vessels containing solutions of the sulphate of iron and copper, lived longer, and exhibited more signs of vigour, than similar branches that were placed in equal quantities of simple water. I have also found that large doses of nitre produce an appearance like genuine gangrene, in the leaves of vegetables, and yet it is certain that nitre, when it is judiciously dosed, may be made to assist greatly the healthy vegetation of plants."

It is well known that peat ashes are much used in England, and elsewhere, as a manure. Professor Robison, quoted by Dr. Pearson, says, "that peat ashes always contain a great proportion of iron, that he had seen three places in Russia, where there was a superficial peat moss, and in all of them, the vitriol was so abundant as to effloresce." All peat, however, does not contain the salt in equal quantity, and sometimes probably it contains none.

A preparation of pyrites, or *sulphuret* of iron, is used in Flanders as a manure. Chancellor Livingston gives the following account, (published in the New-York Society's Transactions, vol. 2.) "In an excursion that I lately made into Flanders, I observed at some distance from the road, several large beds of earth, that appeared to me to emit smoke and flame, which two men were tending. I found that it was pyrites, sufficiently impregnated with sulphur to

burn when dry. This was laid into beds and fire set to it. They endeavoured to extinguish the fire when the ashes were red; if it burned longer, it became black, and the quality of it was not so good. This earth, so burned, was easily reduced to powder by a wooden mallet, and in this state was carried on the backs of asses, forty or fifty miles, as manure, and was used particularly for grass, at the rate of about six bushels to the acre. The seed grain was covered with it as with gypsum in our country. This circumstance induces a belief that the sulphuric acid is both in this and in the gypsum the fertilizing principle. It is presumable, says he, that in this very slow combustion, the sulphuric acid is absorbed by the ashes, or rather earth, while the inflammable matter is dissipated, and that the union of the alkali and the acid forms a salt not unlike, in its chemical relation, to gypsum, or perhaps one that is more soluble, more impregnated with the acid."

Perhaps it would be a more correct explanation of what takes place in the combustion of the pyrites, as above related, to say, that the sulphur of the pyrites by an union with the oxygen of the air, and of the moisture, disengaged from the heaps, forms sulphuric acid and again combines with the iron of the pyrites, forming the sulphate, which afterwards mingling with the earthy particles of the heap, becomes the efficient cause of vegetation as it is in the ashes of peat. The ashes of turf, which, the chancellor says, is supposed in Holland to contain sulphur, and which, no doubt, contains sulphate of iron, is purchased at a high price, and carried into Brabant and Flanders as a manure.

M. Berard, quoted by Judge Peters, vol. 2d of the Philadelphia Memoirs of Agriculture, supposes that the plaster of paris owes its efficacy to the sulphuric acid. "The fertility of the lands abounding in volcanic matter, as in the neighbourhood of *Catania* in Sicily, and near Naples, &c. where the soil is evidently combined with the ashes of the volcano, or of decomposed lava, afforded a strong proof of the vegetative virtue of sulphur."

"M. Berard caused brimstone to be pounded and sifted, and mixed with *ashes* to render the sowing easy. Having spread this powder on *clover* and *lucerne*, on *wheat* and *natural* grass, he waited the effect. It was surprising on the *lucerne* and *clover*, but *little perceptible on the wheat and natural grass*. Repeated experiments gave the same results. It was particularly remarkable that its effect was the most prompt when after its application, a shower of rain fell." The water no doubt facilitated the formation of the sulphuric acid; a combination which the sulphur enters into before, probably, it ever becomes a manure. This same writer recommends sulphur as an ingredient in composts for vines, and reminds us of the fine quality of the wines produced from soils of volcanic origin which contain sulphur.

Judge Peters remarks, "that a small infusion of oil of vitriol in a large portion of water, promotes vegetation, and banishes insects from garden plants." It has been used in the proportion of an oz. of vitriol to a gallon of water, with advantage.

Sir H. Davy in his elements of Agricultural Chemistry, supposes that in all the instances in which either sulphuric acid or sulphate of iron operate as a manure, the acid first combines with lime to form gypsum. The ground of this opinion is that he has detected gypsum in all the plants for which the substance was used as a pabulum. On the other hand, Dr. Barton in the account of an experiment, before mentioned, made with the sulphate of iron as a manure, states that he found iron in one of the branches of the plant, which he had subjected to an analysis. From which he would lead us to infer that the sulphate of iron was not decomposed to form gypsum.

Sir Humphrey Davy gives it as probably *the reason why gypsum is not generally efficacious, that most cultivated soils contain it in sufficient quantities for the use of the grasses.* He must mean also to say, that the reason why in certain instances it is not found efficacious for grain crops, is that the

soil already contains it in sufficient abundance. If his position be true, it is not so much owing to the presence of gypsum in any case, that such wonderful effects are produced on vegetation, as it is to the presence of some other constituents of the soil, which are wanting where it produces no effect; else according to his supposition, vegetation, in this latter case, would be as vigorous as in all others, in which gypsum is applied. Now we may ask what are those other ingredients in the natural soil where gypsum is not found, which act so forcibly when gypsum is added? It does not become an unscientific farmer to discard hastily the opinion of a man so worthy of all respect as Sir Humphrey Davy, but, if he be correct, all those soils which have not naturally enough of gypsum, have some constituents of great power, which are perceived to exist when gypsum is added, and of which it would be extremely desirable to know the nature, and how they could be come at, in order that they might be employed to fertilize such soils, as according to Sir H. Davy, have a complement of gypsum.

If gypsum produces no effect on vegetation, it is because there is already gypsum enough, and neither sulphate of iron, nor sulphuric acid, nor peat ashes can operate as a manure, until the acid they have combines with lime to form gypsum; then the trial of these substances in many parts of Massachusetts would be of no avail. It may, however, turn out on experiment that they are efficacious where gypsum is not.

In a former number of this journal there is an article on the use of burnt clay as a manure. The writer confines himself to a statement of facts as far as I can remember, and attempts no solution of the mode of its operation. The adhesive quality in clay is the great objection to it for vegetation where it exists in great mass. Its adhesiveness is supposed to depend upon its union with an acid. It is said by Mr. Crookshank, (vol. 2, Trans. of the Soc. of Arts,) "That burnt clay dissolved in sulphuric acid, recovers its ductility.

There is, says he further, certainly an acid emitted from it in burning bricks, as is evident to the smell, after a certain degree of heat has been communicated to the kiln; but of what kind this acid may be, I cannot say, though I have seen curriers learn to their cost, that it would stain their leather black, if by any means it happened to get mixed in sufficient quantities with the astringent juice of the oak bark used in tanning." I have seen the leaves of fruit trees blighted by the fumes from a brick kiln in mid-summer; although at the distance of fifty rods from the kiln; an effect proceeding probably from the acid of the clay; or more probably from the sulphate of iron.—Common clay contains a considerable portion of the oxyd of iron, from which the brick receives its red colour.—In the process of burning, this oxyd unites with the acid, and forms the sulphate, and hence we are to account for the effect of the fumes of the brick kiln on leather noticed by Mr. Crookshank.—The *tannin* decomposes the sulphate, and the iron is precipitated, and leaves the black stain.

In burning clay by slow combustion for manure, in the manner recommended in a former number of this Journal, we may fairly presume, that green vitriol or sulphate of iron, is formed in small quantities, and intermixed with the earthy and pulverized mass—and that the latter, when used as a manure, derives its virtue not so much from the mechanical division of its parts, as from the presence of this salt.

The body of testimony here exhibited in favour both of the *sulphuric acid* and of the *sulphate* or *copperas*, as manures, seems entitled to some consideration. But substances of such great power ought to be used, as is obvious, in a very diluted state, as well as the marine or other salts, which have been erroneously held to be poisonous to vegetation. They are injurious only when used in too great quantity.—Every species of aliment will prove a poison both to animal and vegetable life, if too much is administered—while on the contrary, arsenic, as has been justly said, in connexion with

this same subject, when taken into the human system, in extremely small doses, is sometimes a useful stimulant and powerful corrective.

Gravelly and sandy soils have been thought to be most benefited by the use of sea salt and sulphate of iron and the sulphuric acid ; and clayey land by lime.—About a gallon of water to an ounce of vitriol or of the copperas, has been found on experiment to be the proper degree of dilution. But proceeding on a larger scale, seven bushels of the copperas beat to a powder, may be considered a proper proportion for an acre. Peat ashes, where it has been found to contain a considerable portion of this salt, has been used with advantage, at the rate of fifty loads to the acre,—burnt clay at the rate of from thirty to fifty loads.

In those parts of our state which possess much of the rock which contains sulphur and iron, in so great quantity as that it decomposes easily when exposed to the air or to moisture, the farmers may find it profitable to break up the stone into small pieces, and to throw it on a platform of boards, or place it in some other convenient situation, to catch the wash from the mass after rain, when it shall have been a sufficiently long time exposed to have considerably decomposed—or the heap may be artificially watered, and the lixivium received into a vat.

One cannot but wish that a more precise knowledge were possessed by intelligent husbandmen, of the just value of all substances which invigorate vegetation, and which are within the reach of all for use as manures.—Animal dung and some few other things are used by every one with entire confidence in their efficacy.—But many others, and among them the different kinds of salts in their pure state, are held in a vague sort of distrust as manures, not absolutely denounced as known to be fatal in all cases to vegetation, but thought to be of so equivocal a character as fertilizers, as to make it on the whole inexpedient to meddle with them. It is perhaps difficult to bring the mind to realize that a small quantity of con-

centrated salts or other active agents embodied within a small compass, can have the same effect as great masses of barn yard manure. This is without doubt one cause of the incredulity still entertained by some as to the efficacy of plaster. But chemists might shew us by analysis, that all the vegetative virtue of a buck of dung may be resolved into a few salts, a little earthy residuum and pure water—and the salts be found not to fill a peck measure.—When the farmer sees the fumes rising from a heap of stable manure, and mingling with the air, perhaps it does not occur to him that this light and pungent vapour is the life of his manure. One fact will place this in a strong light. Sir Humphrey Davy, in order to test the power of the fumes of a dung hill, tried the following experiment. He filled a bottle with fresh stable dung, and applied the nose to the roots of a grass sod. In a short time the blades began to spring with new vigour, and the grass soon far surpassed in luxuriance other grass around it, which had not the benefit of this stimulus.

All that is absolutely necessary to make any soil fertile in the highest degree, may exist in so concentrated a form that a few pounds weight, brought to a diluted state, shall be sufficient to give a luxuriant crop to an acre.—Perhaps a chemist would say that all our active manures, which are now carried about in such cumbrous loads, will hereafter be presented to us in the form of a pure extract, and in this shape be brought into general use. We do not mean that stable manure, for example, should be subjected to a chemical operation for this purpose, but that we may derive, to a certain extent, from other sources, the virtues which we find in that, and command and apply to the soil the fertilizing principle with less expense and trouble. Thus we may enjoy an advantage similar to that which is likely to attend a recent discovery in regard to the Hop, viz. that " near the base of the flower there is secreted a semi-resinous substance in the form of minute globules, which is the seat of the whole bitterness, for which the hops are generally prized and consumed—and

in which its fragrance and essential properties reside.* Dr. Ives, of New-York, has pointed out a vast saving, which would take place in the expense of transportation and storage, if an article containing all the strength of the hop, and occupying but small compass, were substituted for one which is of more than twenty times its bulk."

Salts are a durable manure. Their effects have been known to last fifteen years. Stable manure owes its power in part to the extrication of much heat which is disengaged in the fermentation it undergoes in the soil. And when after two or three years this fermentation has ceased, the substance of it existing in the form of salts, is too small in quantity to produce longer any sensible effect;—as much stable manure applied at once to the soil, as would contain a permanent base of salts, equal to a few bushels of marine or vitriolic salts as a manure, would generate heat enough in the process of fermentation to destroy all vegetable life. On the spot where a heap of stable manure has been suffered to lie leeching a few weeks, if it is a grass field or old pasture, the salts of the manure, after the second year, having in that time become sufficiently diluted, begin to act as a manure, and will continue many years to produce so striking an effect on vegetation as to distinguish this spot from every other in the field.

The *salts of ley*, so called by the soap boilers, is now thrown away, as of no use, and is called *waste* :—were this applied to the land, reduced in strength by water or by intermixture with earth, it certainly would be found in some instances, at least, a powerful manure.—Salts destroy insects. I have seen in a late newspaper, a sensible letter from a Pennsylvania farmer, in which he states that he has used common salt, at the rate of seven bushels to the acre, for the double purpose of destroying insects and enriching his land. —The salt is sown very early in the spring and afterwards ploughed in.—He says it effectually destroys insects. The heat of stable manure is well known to be genial to various

* Bigelow's Botany, vol. 3. part 2.

kinds of vermin : and in *this land of insects*, as it has properly been called by Professor Peck, it is highly important all means should be employed to exterminate those of them which which are noxious to esculents.

It is a circumstance in favour of the general use of barn yard manures, that they contain so great a quantity of components, as that no soil fails to derive benefit from some one or more of them. But if it can be ascertained by experiment with the various substances they contain, (as these have been already discovered in part by chemical analysis) which of them are best suited to particular soils and particular crops, the components of dung may be obtained perhaps at a cheaper rate and applied to the land more profitably from some other source. A regular series of experiments by a number of gentlemen on different estates, which should embrace a fair and full trial of all those substances which may be called *uncertain manures*, could not fail to give valuable results; particularly if the experiments were pursued systematically, and the gentlemen would hold themselves responsible to communicate faithfully their experience. Good things are some times lost sight of amidst the multiplicity of other cares, or because in point of interest, they are not immediately important enough to be regarded by those who are best able to ascertain their true value, and whose recommendation would go far with the public.

I beg leave to trouble you with a few remarks in relation to the management of stable manure. An agricultural chemist who should watch the progress of a heap of this manure, as it is commonly treated, from the time it is first formed in the yard until it is used, would perceive that it had lost from 50 to 75 per cent of its value. Suppose a large heap of carrots exposed in a field all winter to the frost, without any covering, and in mid winter after those on the outside and to a considerable depth, were frozen, the farmer should go to work and turn the heap; turning those which were frost bitten, in, and a portion of those which had not as yet suffered,

out, to take their chance for the rest of the winter.—The heap being very large, a few bushels would be found probably sound in the spring.—With almost as little consideration do farmers some times manage their manure heaps. Every farmer who would make the most of his manure, should provide before hand, a large mass of earth in his barn yard, and intermix the manure as it is made with a portion of this, both for the purpose of preventing a violent and destructive fermentation, and to take the natural vapour of the dung. And as often as the heap is turned, there should be left over it when the work is done, a crust of earth three or four inches thick, to keep in the fumes and promote their consolidation with the mass. There is nothing new in this method of manageing barn yard or stable manure, to the theorist and the really good farmer. But no one can say with any propriety, that it is not new to him, if he has not practised it.

A FARMER.

COL. PICKERING ON THE LOCUST TREE.

Salem, March 2, 1821.

DEAR SIR,

I HAVE just now read, in the last number of the Massachusetts Agricultural Journal,* the remarks and questions of the Trustees prefixed to General H. A. S. Dearborn's letter on the Locust Tree, and the destructive worms which infest it; on which subject communications are requested.

To the first question I answer, that *climate* appears to have no influence on the insect; for in New-Hampshire are locust trees uninjured, as well as in some of the southern states. But in the latter the insect is not unknown. In the city of Washington I have noticed the stems of young trees full of the same bunches which distinguish those in Massachusetts, infested by the worms: while in Georgetown (ad-

* No. 3. vol. vi.

joining the city) I have seen thrifty locust trees, of a larger size, unmarked by a single worm. The latter had not been *transplanted*, and so *debilitated;* and were likewise so near together as to effect a mutual shade.

To the second, that although white washing with lime is unquestionably a useful, (but probably not an effectual) remedy, and applicable to a small number of trees, it may be nearly impracticable to extend it to a forest. A close growth of the trees, so close as to form a continual shade, I have reason to think would operate beneficially, though not to the entire exclusion of the insect. About twelve years ago I sowed a parcel of locust seeds in rows three or four feet apart. They now form a small thick grove. I repeatedly transplanted some of them, at the distance of a rod, on the two sides of a lane. These were attacked by the insect; the worms perforated the stems; and in high winds they were easily broken off. I renewed the planting; but the same evil ensued; while those remaining in the grove are not so much infested as to prevent their growing with tolerable thrift.

My own practice is an answer to the third question: The locust trees of the northern and southern states are of one and the same species: All the seeds I have sown were gathered from locust trees in the district of Columbia—chiefly in Georgetown. There the product of seed is very abundant; and to such a degree, that I think it would be easier to gather a peck in that district, than one quart from any trees I have seen in Massachusetts.

Yet I believe the Locust tree to be indigenous in Massachusetts and New-Hampshire: at least the *latitude* does not forbid the supposition. I have passed through a township in the state of New-York, above the forty-second degree of latitude, in which the *native forest trees were locusts.* The greater part had been felled, and split into posts and trenails—the latter carted across to the Delaware, and floated on rafts of boards to the Philadelphia market. Some large trees remained standing.

I am satisfied, that, above all other trees, the locust should not be raised in nurseries. The seeds sown at the time of planting early beans, soon vegetate; and on a barely middling soil, will rise, the first year, to the height of two, three and four feet. I have had a small number rise to the height of five feet.

You may have observed, that in the annual shoots of young locust trees, there are protuberances of an inch or more in length, in which the twigs are of twice the size they bear on each side of them. In every protuberance is a worm, of a reddish colour, which lives and has its growth on the pith. What insect is produced from it I do not know. I recollect that professor Peck describes two species of insects that infest the locust. Perhaps this may be one, and that described by General Dearborn the other. I have thought that were I to raise a considerable number of locust trees with a view to timber, I would constantly cut off every shoot, in which a protuberance appeared, while the worm was in it, and burn it.

I have thought the most eligible mode of raising locust trees in quantities for timber, would be to take a piece of land in tillage, plough and harrow it, mark it into squares, of three or four feet, and plant the seed at the crossings of the lines, three or four seeds in a spot, and after one year's growth to pull up all but one. Perhaps, too, it may be eligible, in the spring of the next year, to cut every tree down at the ground, to produce a more vigorous growth; as the locust springs luxuriantly from the stump.

I am, dear sir, very respectfully yours,

T. PICKERING.

John Lowell, Esq. Corresponding Secretary.

GENERAL SUMNER ON THE LONG WOOLED SHEEP.

Boston, April 14, 1821.

Richard Sullivan, Esq.

DEAR SIR,

I HAVE the pleasure to enclose to you, two ribs of corned mutton, from the fore quarter of a three year old wether, of the long wooled breed of sheep, of Bakewell's cross. The sheep was raised and fatted by Aaron Clement, Esq. near Philadelphia, and was killed in March, 1820. He was fed, during the summer, on picked grass, with 15 or 20 others, and for the 4 or 5 months following, with ruta baga and corn, as much as he could eat. He weighed, in the quarter, one hundred and forty-nine pounds; and the flock was sold at $20 a head to the butchers, who obtained $3 a piece for their skins, and as much more for their rough fat. One of them had a caul which weighed 19lb.; and if you take the trouble to measure, you will find the clear fat on the small ribs of this, full three inches thick.

I took charge of the sample which Mr. Clement presented to me, for the purpose of showing it to the trustees of our Agricultural Society, which I wish you to do for me at their next meeting, as I am well convinced, that their patronage is necessary to the introduction among us, of a breed of sheep, which from the length, strength, and quantity of their wool, as well as from their size and disposition to fatten, would be a valuable acquisition to our farmers and manufacturers.

I am interested in an establishment for the manufactory of worsted, and good combing wool is extremely difficult to be found. One reason of this has been, that no other breed of sheep, but the Merinos, has received much of the public attention; and sheep of all kinds have been permitted to run together, so that there is not in the country, perhaps, any but the Merino breed of sheep, which has been kept

pure and unmixed. Another reason is, that although a considerable quantity of long wool is pulled and sheared in this part of the country, yet, all that is sheared on the same farms, is usually packed up together, without regard to the various uses for which it is purchased. The hatter wants wool of one quality, the spinner of another, and the comber of another. Hence it is apparent, that if our wool, when it is brought to market, should be properly stapled, so that the manufacturers should not be obliged to buy what they don't want, in order to get that which they do, they could each afford to pay a higher price for what they purchase, and the farmers would, of course, turn their attention to the cultivation of that kind of wool, which is most in demand.

I am the owner of a large flock of Merino sheep, and have sensibly felt the prejudice against them. This is now very much weakened, so that those sheep sell for double the price they did last year. But still there is enough of it left to afford great encouragement to the introduction of a breed of sheep, of totally different, and I might almost say, opposite qualities. Should not even an unjust prejudice be fostered, when it can be turned to so good an account?

I am, dear sir, with great respect,

Your friend and obedient servant,

W. H. SUMNER.

ON THE GROWTH OF WHEAT.

[To the Corresponding Secretary.]

SIR,

HAVING in the year 1792 seen many large fields of excellent wheat, in the interior of New-York, I had a desire to try that kind of grain on my land, believing that I could raise my own flour. Accordingly I obtained a small quantity of spring wheat, and sowed it on good land, but although there was much large straw, yet the wheat was smutted and

blasted. I then concluded that the season was unfavourable to the grain. The next year I sowed a part of the preceding year's crop, and the result was worse. The wheat was more smutted and blasted than before. Not yet discouraged by the last crop, I sowed the third year on rich land. Suffice it to say, that I had large straw, but it was so smutted and blasted, that it was disagreeable to pass near the piece on which it was sowed, from the stench it afforded while standing. I then relinquished all hope of raising wheat on my farm, concluding that the soil was unfavourable to the grain.

In the year 1812, I was surprised to see, in a neighbouring town, two or three pieces of very good wheat, about fit for the sickle. On inquiry I found that wheat had been raised in that neighbourhood for years, that the seed was obtained from the northward, and frequently shifted, and also, that it was necessary to prepare the seed for sowing, to prevent blast and smut.

In the month of April, 1813, I prepared a piece of land, by well ploughing, for wheat. And with a view to promote vegetation, and prevent smut, the seed was soaked in a strong solution of soap, then limed, and immediately sown. The wheat came from Vermont, and was of that kind which has little or no beard. The crop was good, and without smut or blast to injure it. The produce was at the rate of 16 bushels per acre, and weighed 55 lb. 4 oz. per bushel.

In 1814 the experiment had much the same result. The land sowed did not produce so many bushels per acre, but the grain was better, and yielded 37 lb. 14 oz. of good flour per bushel.

Since which time I have raised wheat almost every year, and with success. The preparation of the seed is of the utmost consequence; I first wash it clean, then soak it in a strong solution of soap, in which a small quantity of nitre, (say half an ounce to a gallon of the solution), is dissolved. I have not been very particular as to the time of soaking the

grain, but a few hours before sowing it, I have added a small quantity of green vitriol in solution. As to the quantity of vitriol, about the same as that of nitre. Lastly, drain off the solution, and add slacked lime, a sufficient quantity to prevent the grain from adhering corn to corn, and sow it immediately.

In 1817 the produce was 20 bushels per acre. In 1819 I sowed a small quantity of Spanish wheat, which I received of B. Guild, Esq. It did well, notwithstanding the extreme dry weather in July, which was an injury to it. The grain was large, but not so white as some other kinds. In 1820 I sowed the same kind, and with success, yielding about 16 bushels per acre. By the politeness of R. Sullivan, Esq. I obtained a quantity of Poland wheat: To this I paid great attention, but only a small part sprung up, and what appeared, was winter grain, and came to nothing.

It is here proper to remark, that in every instance recollected, where I have sowed spring wheat, I have at the time laid down the land to grass, and it is frequently the case that the young clover and herd's grass overspread the ground before the grain comes to maturity; and this is one cause why the crops have not been more abundant.

Respectfully,
R. GREEN.

Mansfield, March 9, 1821.

ON ORCHARD GRASS.

Jamaica Plain, 28th May, 1821.

DEAR SIR,

KNOWING your exertions and success in the *Soiling System*, and having lately read the enclosed piece on the subject of *Orchard Grass*, which appears so admirably calculated to assist in that object, induces me to send it to you for publication in the Repository.

I have cultivated this grass for several years past, at the recommendation of a respectable clergyman in Connecticut, and have been much satisfied with it, if cut for hay before it gets too ripe, but have thought it came up very scattering, considering the quantity of seed sown, (never less than two bushels per acre, and of my own raising). This year, however, in reading the inclosed paper, I prepared the seed as therein directed, and put two bushels on an acre, with ten pounds red clover seed, and it has come up, as freely and as thick as my *Herds' or Timothy grass*. It was sown on barley, with *Bennett's* broad cast machine, at the rate of one acre in less than one hour.

Very respectfully, your's,

JOHN PRINCE.

Hon. Josiah Quincy.

[From the Farmer's Magazine for August, 1815.]

In a letter from Mr. Wm. Falla, *Seedsman, Newcastle, to* Sir J. Sinclair,—*on Cocksfoot Grass, (Dactylis Glomerata), or, in America, Orchard Grass.*

On the subject of Cocksfoot Grass, I beg leave to make the following observations, which I find I cannot do so well in the way of answers to your queries, as in the manner I adopt. I have for many years dealt in the seed of this grass, with which, till the year 1813, I supplied myself from dealers in London. That year, and the season of 1814, I purchased it, to a considerable extent, of persons who collected it in this part of the country; but not having been able to induce many agriculturists here to make trial of it, the greatest part of the seed has been sent into other neighbourhoods. The results of the few trials that have been made here, have not been favourable; not from any fault in the seed, nor unsuitableness of the ground it has been sown upon; but from its having been sown among corn, generally wheat, and from the seed not having been properly

prepared previous to sowing; without which, particularly, should dry weather happen after sowing, generally speaking, it will not vegetate. It should be sown on well cleaned naked ground, with or without clover, and if the land can be got ready, in the month of March; if not, any favourable time in April will do; previous to which, the seed should be laid on a barn or other floor, and moistened by water out of the nose of a watering-pot, turning it over frequently, and increasing the moisture, if necessary, for at least 48 hours, being careful that no heat takes place. By this time the seed will be well swelled, and the radicle ready to strike; and in this state it should be sown, (the ground having been previously harrowed with a light seed harrow), and then brushed in by some such means as what is called a brush harrow, which is made here by winding thorns through a gate, and the gate laid and drawn horizontally over the land; and finally rolled. The quantity of seed sown per acre has generally been two bushels; which is quite enough, if a few pounds of clover seed are sown with it; but if it is sown alone, perhaps two and a half or three bushels may be necessary; at any rate it will be safer. I sowed an acre this spring, which has succeeded in the most satisfactory manner; while some of my customers, with the same seed, but sown with wheat, and without the recommended preparation, have totally failed. I sold upwards of twenty bushels of cocksfoot grass seed, in 1812, to George Gibson, Esq. of Stagshaw-house, which I presume, for want of proper management, (although he is a very judicious and enlightened agriculturist) totally failed. He was, in consequence, very much dissatisfied, supposing the seed in fault. He having made a serious and second complaint respecting it in the following spring, and my clerk having been so fortunate as to find a sample that had been kept of the seed sent to Mr. Gibson, I sowed a little of it on a single square yard of my nursery ground; and, though one year old, it grew most charmingly. I am thus particular respecting this sample.

yard, because I made it the means of what I think a very interesting experiment. It was sown, as I recollect, in the month of March, on ground that was light, and in tolerable good order, but that had had no manure put on it for several years. The grass was not cut, nor in any way disturbed, that year, as I hoped to have had an opportunity of showing it to Mr. Gibson: indeed I had no intention of making any other use of it. But in the spring of 1814, it had so abundant and beautiful an appearance, that I was, on the 30th of April, (a dry day,) induced to cut and weigh its produce, which I found 16 pounds, amounting to the astonishing quantity of *thirty-four and an half tons* per acre! and that at a period when any other green article, fit for soiling, was not above two or three inches long. I cut it again the 24th June, and obtained 8 pounds; and again the 10th September, when I had 10 pounds, (both dry days); making a total, from the three cuttings, of 34 pounds, equal to *seventy-three tons* per acre.

I observe that wonderful accounts are given of the value of this grass, as used in Norfolk, for sheep pasture, of the truth of which I have not a doubt; but, whatever may be the extent of its value for that purpose, there certainly has been no article yet recommended or used, at all comparable to it for early soiling, the time of all others when such an article is particularly wanted. I must observe, that where cocksfoot is intended for early soiling, it should not be cut or eaten, the autumn before, later than, I think, the 1st September. In the year it is sown, I do not recommend its being cut or eaten at all.

REVIEW OF "A TREATISE ON AGRICULTURE, &c. BY A PRACTICAL FARMER." "Albany."

[Concluded.]

In our second number of the present volume we introduced this treatise to the notice of our readers, because we thought

and we still think, that it deserves a high place among our original treatises on this subject.—We did not continue our remarks upon it in our last number, because we make it a rule to prefer original communications of merit, to our own remarks, in which we cannot presume to place as much confidence.

It may be recollected by those who take any interest in our Journal, that we mentioned the author of this tract as a man of shrewdness, of various and extensive reading, and as possessing a more enlarged library on agricultural and physiological subjects than falls to the lot of most Americans. We even ventured to suggest, from the obvious partiality displayed by the writer, in favour of French philosophy and French agriculture, that he probably was a naturalized citizen, an emigrant from France. It is now pretty well understood, that the author is a late ambassador from the United States to France,—and if this be true, we do not think it detracts from the correctness of our opinions founded on internal evidence, as to the character and prepossessions of the writer. From such a source we should expect all the energy, boldness and vigour, which we were ready to allow to the author. His opportunities and his taste led him to form an intimate acquaintance with the state of French agriculture, to enrich his library with all the modern French works on the subject, and if it be true, as we have heard but dare not believe, that he omitted the fairest opportunity ever offered of making himself well acquainted with British agriculture, we can account for his predilection for that of France. It is a systematic plan of the French sçavants to assume every thing as their own—to borrow without returning, or acknowledging the favour.—Much of this spirit has been shown in our former notice of this work, and the same feeling will be discovered in the parts which we are now to notice.

We concluded our remarks on this work in our second number of the present volume, with some strictures on the author's observations, as to a succession of crops as ap-

plicable to the United States, in which he seemed to rely much on Mr. Strickland, who paid us a flying visit from G. Britain and understood about as much of our agriculture, as Weld and Birkbeck and Fearon did of our politics and manners.

We shall now proceed to notice the author's remarks on the plants recommended for a course of crops and their culture.

He commences, as every sensible man will do, with the potato, the first undoubtedly of root cultivation—perhaps in the northern states the first plant in every view except our staple, the Indian corn.—He states the prejudices it long encountered in France, and even its proscription by the government as a deleterious vegetable. He further states that its credit is fully re-established even in that country of prejudices. They now call it "the manna of the poor," they place it before every vegetable but wheat, and far before cabbages, carrots, and turnips. We are happy to hear this testimony from a nation who thirty years since considered the potato a poison. He says, and says truly, that this is not its whole praise, he might have said it is its least or smallest praise. "It is, says he, of all vegetables, that which from the number, shape and size of its roots forms the best preparation for subsequent crops:" and he might have added, what we shall take the liberty to add, that its tops form the most complete shelter of the soil against the scorching and impoverishing rays of our vertical sunbeams: and at the same time are so fatal to the growth of all exhausting weeds, that if it had no other merit, this alone ought to recommend it to our favour. He might also have added, that its stalks restore to the ground a greater quantity of vegetable matter than any plant with which we are acquainted. It may indeed be considered the restorer of exhausted nature. Another idea has been overlooked, or we might more modestly say omitted by our author—It is the only plant, for we will not except the carrot or parsnip, which compels even the lazy cultivator to break open the soil, and pulverize it, in order to procure his harvest.

In the cereal and grass bearing plants we never move the

soil. In the cabbage and turnip tribes but slightly—but we cannot, let our avarice or indolence be as great as they will, obtain our crop of potatoes without a more complete sub-division of the soil than we can even obtain by the plough.

The potato then is one of the farmer's best friends, and we owe more to S. America for its introduction than for all the gold and silver which its mountains have ever furnished.*

He then informs us, that Botanists count more than sixty varieties, and twelve species of the potato, but for agricultural purposes, he says they may be reduced to three, the *red*, the *white*, and the *quarantaine* or forty days potato—or in other words the early potato, a variety produced by artificial culture.

Who is the Botanist that will dare to limit the *varieties* of the potato to sixty? or who even pretends that of the solanum tuberosum there are *twelve* species? We may be mistaken, but we can find in no book in our possession more than one species of the common potato. This however, is of no greater importance than that our writers of talent and learning should not give occasion to Europeans to smile at us. But the other remarks are of serious *practical* importance. It is true, that to agriculturists, there are no distinctions among potatoes but into red, white and early potatoes, or as the French call them quarantaine?

What red and *what white* potatoes are intended? Are they the old cranberry red, long since out of culture because unproductive? Or are they, the River Plate long reds, so different from all others, as almost to merit the distinction of a separate species? What becomes of the real blue potato with a rough skin? Or the modern blue potato of a copper colour with blue eyes, a prolific and popular variety? Of the white with red eyes, called the Lancashire potato? Of the potatoes with yellow skin and yellow flesh, now the favourite

* We know that the potato is popularly given to *North* America, and that Sir Walter Raleigh is said to have introduced it from Virginia. The best naturalists consider it a plant of South America, and we do not know that it was ever discovered growing wild in our country.—Pursh and Michaux did not discover it here. It appears to us clear, that after 200 years, it would have been found in a wild state, had it been a native of Virginia.

potatoes of the north? Ought we on this subject to omit to notice the *asserted fact*, that varieties of potatoes run out in the course of from twelve to fourteen years? Who can find one variety to which he was accustomed in early life?

The long Spanish potato with a pink coloured centre—the round blue rusticoat or rough coated potato, are entirely extinct. They were succeeded by the cranberry or round red potatoe which is also extinct. These have gone out in spite of every effort of art, and of all the prejudices of cultivators. One after another drops them and they disappear to be seen no more. In this region of potatoes, we know well that we change our seed, and that not from choice, but necessity.

We have not made these remarks in a spirit of cavilling or criticism, but because we think it proper our farmers and other intelligent agriculturists should understand, that either by sowing the seeds, or by importations they must, as they always have done, change their seed at least every ten or twelve years.

This writer has never seen more than 400 bushels raised on one acre in our country, but our late journals exhibit instances of 500 and even 550 bushels, though we doubt whether our country will ever attain to the great products sometimes exhibited in Ireland and Great Britain, because the potato loves a soil and *climate* more moist than any which the United States can furnish.

On the subject of the culture of this plant, this writer furnishes few new ideas, but he lends his influence and his powerful and decided language in favour of the practice of planting large, well grown potatoes for seed, in preference to small ones, or cuttings, or sprouts, in which we fully agree with him. We think not only the analogy of all other plants, but what is of more moment, the weight of experience, is on that side of the question. We have, it is true, in the last 30 years, seen many ingenious experiments on a small scale, by which it would seem, that on the whole, cuttings were as good

as large and full grown potatoes, but on a large scale, we have not had one experiment in support of this opinion, and our own experience of fifteen years, and that of our best informed neighbours of far greater experience, would seem to justify the employment of the best potatoes for seed. We are persuaded that thirteen bushels to the acre of full grown and large potatoes, will amply reward the cultivator for the additional expense of seed.

We cannot concur with the writer in the slovenly and dangerous practise of harrowing the potatoes after they are out of the ground, in order to extirpate the weeds, still less in the repetition of that experiment with a narrower harrow.

The plough, and the hoe even when potatoes are cultivated on a large scale, we believe to be much more economical.

The next article of culture, mentioned by the author, is Rye. Though inferior to wheat, there are some circumstances under which he thinks it may have a preference ;—these are, " 1st, it may be raised in soil where wheat cannot."

2d, " It bears a much greater degree of cold than wheat."

3d, " It goes through all the *processes* (or as the writer too quaintly expresses it) all the *phases* of vegetation in a shorter period, and *of course exhausts* the soil less," (a non sequitur or false consequence as we think.)

4th, If sown early in the fall it gives a great deal of pasture without *much* eventual injury to the crop, (this also requires accurate investigation before we decide,) and 5th, " Its produce from an equal surface is one sixth greater than that of wheat.

These circumstances render it precious to poor soils and poor people, to mountains of great elevation, and to high northern latitudes."

These remarks are certainly just.

Its use as food for horses, he remarks, is well known in this country and Europe. The grain and straw chopped and mixed, forms the principal horse food in Pennsylvania.

It follows potatoes in a course of crops in poor lands.—He recommends early cutting—" cut two days too soon rather

than one day too late," is quoted as one of the precepts of Cato, and we believe it would save many crops of wheat as well as rye.—It seems of late to be a very fashionable doctrine in the wheat countries of Europe.

The next article in a succession of crops noticed by the writer under review, is Turnips, and here we would respectfully suggest, that, with the exception of the yellow turnip or ruta baga, we doubt whether in the northern and middle states, we shall ever be able to introduce the turnip to advantage in a succession of crops. It has always appeared to us to be one of the cases in which we have followed the European cultivation, without a due attention to the difference of our climate. That turnips may be raised in favourable years, in great quantities, after a culmiferous crop, has been removed, we have no doubt, but as we can seldom if ever feed them on the ground, owing to the severity of our frosts, we doubt the economy of this culture. The common turnip is kept with difficulty, deteriorates by keeping, and is in all cases a very indifferent species of food.

Our author speaks of two methods of cultivation, one for the purpose of ploughing them in as manure, the other of raising them for food. The first object has never, so far as we know, been pursued in New England, and we should doubt whether in a climate so cold, we could turn them in to any advantage, after a crop of grain had been taken from the soil.—They would, we should fear, not be sufficiently rotted to be of much use in that way. To protect the turnip against the fly, its mortal enemy in its early stages, he recommends the use of ashes, the well known and constantly employed remedy—and he suggests, in a note, that on a small scale, the water in which potatoes have been boiled, has been thought a protection against this destructive little insect.

With respect to the Swedish turnip or ruta baga, the author candidly admits that his experience is limited, and we should think so, since he quotes Mr. Cobbett's experiments as having tended to recommend the plant, and seems to be ig-

norant that we had been for several years before Mr. Cobbett's experiments were pompously announced, in the practice of raising this root on a pretty large scale. It is, without question, the best of the turnip family, though like all newly introduced plants, it has had many extravagant things said in its favour.

It will not in general produce very heavy crops, but it is very nutritious—a great favourite with cattle, and except with milch cows at the time of their giving milk, on account of its effect on the taste of the milk, a very excellent food. It keeps better than any known vegetable, and retains its goodness till new vegetables appear.

The next article in the succession of crops noticed by our author is Barley. It is, as he remarks, very valuable as being adapted to the greatest variety of soil and climate, less subject to the attacks of insects and more easily preserved. This undoubtedly is the reason why it has been, and will long continue to be, the favourite plant to introduce our clover and grasses. It is, he says, a food on which cattle do well, and on which horses *arrive at the greatest possible perfection.* This fact is new to us. It is with us principally employed in the breweries.

The author then proceeds to the consideration of clover, our most valuable grass, and he adverts to a quality which is, we fear, little known in our country, notwithstanding the efforts of Colonel Taylor and other ingenious cultivators, we mean its ameliorating effects on the soil.

He says it is but about two centuries since it first became an object of agricultural attention as forage, or food for animals, but that its beneficial effects on the soil, owing to its peculiar system of roots and leaves, were known only very recently. He does not explain the manner in which it thus operates, but we conceive its principal effects are to be attributed to the multiplicity and breadth of its leaves ; the density of its foliage, which protecting the earth from our scorching suns, and checking by its very rapid growth the progress of

other plants, prevents the exhaustion of the soil, and of the manure put upon it, by evaporation. We can scarcely conceive, that it operates in any other way, and it is principally to the same cause we are to attribute the excellent effects of a potato crop.

The ideas, which this writer suggests as to the culture of clover, which may be thought either new, or deserving experiment, are, that ten or twelve pounds of clover seed are sufficient* in an acre of rich land, and if poor, double that quantity, and that the practice of mixing the seeds of timothy (our Herd's grass) and rye grass is a bad one, because these grasses neither rise or ripen at the same time. Another bad practice, he says, is, to sow the clover with the winter grain, when a large proportion of the seed inevitably perishes.

We must own, that we have for many years doubted whether our treatment of clover was judicious. It is most certainly contrary to the practice of European cultivators of the highest intelligence. The clover is a biennial plant. It would seem to us to be best to treat it as a separate crop; and to follow it either by some species of grain, or potatoes, and to sow our herd's grass and other grasses by themselves. I know well that our system is a seven years one, or at the least five years. That we do not relish the breaking up our land at shorter periods. Finding the clover runs out the second or at the utmost the third year, we are tempted to mix with it a more permanent grass; but we do not inquire whether both grasses are not injured by the mixture.

It is certainly true that the clover is ripe for the scythe a fortnight before the herd's grass, and it is equally true that the clover must injure the herd's grass—but as we are most resolute not to employ the plough oftener than we are absolutely compelled to do, we prefer the mutual injury which these plants, so unlike each other, produce, to a system which would give us more hay, and a more equal crop.

* We usually sow not more than six pounds.

On the subject of the time of cutting clover, our author remarks, 1st. That clover cut before it is in flower, abounds in water, has but little nutritive matter, and is apt to produce indigestion in cattle fed upon it.

2d. Clover cut after seeding, is hard and woody, and no longer retains its leaf; and, 3dly, all plants cut after seeding exhaust the soil, and to this rule clover is not an exception.

From these rules the author concludes, that the short period between the flowering and seeding of clover, is that in which its use would be greatest, either as food or as an ameliorating crop.

This, we are fully persuaded, is true, without qualification; and we hope, and believe, that the opinion is gaining ground. Perhaps the best rule to adopt, as a general one, is to cut this plant when about one third of its flowers begin to turn.

He recommends the Dutch practice, as to saving seed of the clover where the *first* crop is cut before it flowers, and the *second* is reserved for seed.

He states two modes of getting in, with safety, a clover crop, the most difficult of any to make into good hay. The one to scatter over each load, when put up, two or three quarts of salt, the other to interpose between every two layers of clover, one of clean straw. By the first the whole mass is rendered acceptable to cattle. By the second the quantity of nutritive forage is increased, and by both the clover is effectually prevented from heating.

Of wheat, with the culture of which we should have expected the author to be extremely well acquainted, very little is said, and of that little nothing that is new, except a pretty strong assertion that Tillet, Tessier, and other French philosophers *have shown* that smut and charbon in wheat are *produced* by an intestinal parasite of the Uredo or mushroom family. We have understood, that this question is not yet at rest. Sir Joseph Banks, indeed, has proved that a

parasitical fungus is found on the wheat plant, but it is wholly different from smut or charbon, and the causes, as well as preventive remedies, are not yet settled, though all cultivators recommend the washing the seed, differing exceedingly, however, as to the solutions in which it should be washed, some preferring ley from ashes, others brine, and others a solution of various other salts. We were much disappointed in this part of our author's treatise.

Of the culture of peas the writer speaks favorably; is of opinion that they are not an exhausting crop, but on the other hand, by stifling weeds, and checking evaporation, and finally, by being ploughed in, they ameliorate the soil. He is of opinion that they may with advantage be mixed with more erect plants, such as rye and oats. He recommends feeding them on the ground by hogs, by which much labour is saved. No manure is lost. What is refused by the hogs is given back to the soil, and the rooting of these animals in this case is beneficial.

Indian corn is next introduced. We shall notice only such remarks of the writer as are either new, or, if not new, merit to be enforced by the weight of new authority. The seed should be taken from the finest ears of the last year's crop, and from stalks which produced the largest number of ears. The seed should be steeped 24 hours in a strong solution of nitre (saltpetre) before it is planted. (This, we believe, is not with us a general practice.

He says, very little difference in results is produced by the different modes of planting in furrows, in hills, in distant rows, with potatoes or mangel wurtzel between. The greatest success we have heard of has been in furrows, and cultivation solely by the plough. We allude to the case of the Hon. Mr. Hunewell, to whom our highest prize was awarded last year. "Corn is sometimes cultivated as fodder only, in which case it is generally sown, broad cast, at the rate of ten bushels to the acre, and *cut green*. In the volcanic soils of Italy it sometimes produces four green crops in a year."

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We think the writer must have been mistaken in the quantity of corn sowed broad cast on an acre. We are persuaded that from two to three bushels would be ample; better than a larger quantity. The Hon. Mr. Quincy has tried the Indian corn as green fodder, and with success, though he was not able to obtain more than two crops in a season. If we shall ever adopt, extensively, the system of soiling, or feeding our cattle in the barn in summer, the Indian corn will be invaluable to us as green food. Of Beans little is said, except some praise of the Heligoland bean, which seems to do better every where than with us in New-England. Of the cabbage, as one plant in a succession of crops, our author speaks in great praise, and it will be seen by our last journal that it is cultivated in this part of the country with great success. We do not think, however, that the objection of the difficulty of preserving them is sufficiently obviated by the writer upon the authority of Mr. Cobbett. We hold that authority very cheap. He was a bold and lively writer, but one whose accuracy cannot be relied upon. In the vicinity of the sea coast the cabbage can be well preserved by a covering of sea weed; but in the interior we fear it would be difficult to find a covering which would not prove too expensive. On Buckwheat, which is the only article remaining under the head of a rotation in crops, little is said which is not well understood.

Among the plants which may be occasionally raised in a rotation of crops our author enumerates madder, woad, the poppy, the sun-flower, the palma christi, and flax. Of the five first we would only remark, that they can never enter into a general system of agriculture; and it may well be doubted whether we can, in the present state of our cultivation, while our intercourse with Europe is so open, raise them to advantage. We are surprised to find the important staple of flax placed among these rare plants which require so much capital and time for their preparation for the market. Flax, it seems to us, claims an eminent place among

our staple productions, and ought to be raised on every extensive farm which furnishes land suited to its cultivation. Our author makes but few remarks on this invaluable plant, but our readers will find this deficiency amply supplied by the learned and elaborate treatise on that article, at the head of the present number.

Some mention is made of the New Zealand flax. It is not flax any more than it is hemp, and it bears no resemblance to either, though applicable to the same purposes, and perhaps more valuable than either of them.

Our author says it has been naturalized in the north of France. If this be so, it may be raised in N. England, or at least in the middle states. This Society will feel much indebted to any citizen of the United States, who will introduce the plant or its seeds from New Zealand or from Europe. We ought to say, in compliment to an intelligent gentleman of Roxbury, Capt. Dorr, that he brought home from New Zealand, beautiful specimens of the prepared flax or plant fit for spinning, and also seeds, which however, owing to the length of the voyage, did not vegetate. We would suggest to our patriotic mariners, the expediency of sowing the seeds in a box or pot, and bringing home the live plant as well as the seeds. The seeds are best preserved in dry sand.

We had intended to go on and furnish a perfect analysis of this work, instead of a review, as such works are commonly conducted, because we believed that in so doing greater good would be produced, and a greater number of persons be induced to purchase and read this work. It has its imperfections, as we have attempted to show, and what work has not? And what original American work of so small a compass can be found, which contains such a variety of matter, and so complete a system?

It is calculated, and probably was intended, principally for the better informed class of cultivators,—to excite a spirit of inquiry and research, rather than to give a perfect manual of agricultural labours and duties.—As such we cordially recommend it to our readers.

Leominster, May 10, 1821.

My Hon. Friend—*Sir*, As I have had some conversation with you on agricultural pursuits, and knowing your laudable ambition to encourage the same, I take the liberty to communicate a few lines to you on the raising of potatoes; and should you think the following method of raising potatoes would be more useful than those now generally used, and that it will tend to subserve the interests of agriculture, you are at liberty to make what use of it you please.

The value of potatoes was but little understood by our ancestors. My grandfather, since my remembrance, observed that he raised, in one year, six bushels of potatoes, but found so little use for them during the fall and winter, that he threw away one half of them in the spring.

They are now, however, so highly esteemed, that it is not uncommon for a farmer to raise from two to four hundred bushels a year.

To ascertain, therefore, the best method of raising them, as it respects both the quantity and quality, will not, it is presumed, be thought unimportant.

The method by which I was taught to raise them, and which I believe is now too generally practised, was, to plough the ground very deep, make deep furrows, so as to receive a large shovel full of manure, then to plant them upon the manure, and to cover them very deep with earth. After they had come up, I was taught to plough deep between the rows, and hoe the earth round them, so as to make large and high hills. From the following facts and observations, I am fully convinced the above method is wrong.

About twenty five years past, I ploughed a piece of wettish land, covered with small bushes, for the purpose of subduing them, owing to the roots of the bushes, I was unable to plough deep, or make deep furrows, the manure was put on the top of the furrows, the potatoes placed upon that, and earth carted to cover them, whereby they were but thinly

covered with earth. After they had come up, they were hoed several times before they blossomed, the earth each time loosened from the roots, and replaced by a little fresh earth, but not so as to make the hill large. In the fall, after the frost had bitten the tops, but killed the fibrous roots, they were pulled with ease, not being deep in the ground, and shook between the rows, where they remained in the sun two or three hours, they were then carried into the cellar; and, not expecting them to be so good as some I had raised in the common way, intended only for the use of the cattle, but the family, not knowing this circumstance, used them a number of times to eat, and finding them remarkably sweet, mealy and palatable, led me to an inquiry into the cause:—being unable to account for this in any other way, than their not having been planted and covered deep in the earth, I was determined next year to try the experiment, which I did in the following manner.

A part of my potatoes were planted as usual, and a part were planted near the top of the ground, covered but thinly, and afterwards hoed so as not to make large or high hills. In the fall, those potatoes planted and cultivated in the manner last mentioned, were far more sweet and palatable than the others.

Since that time I have planted and cultivated my potatoes by the following rules:—

1st. Plough the ground but a few days before the potatoes are planted, because otherwise it will settle and become hard.

2d. Furrow the ground for the purpose of making a mark where to place the manure for each hill, about four feet apart, so as to let the rays of the sun in between.

3d. If the land be moist, the manure should be of a light or strawy kind, if dry, it should be finer, or of a moister nature, and the furrows a little deeper.

4th. After the manure is placed, drop the potatoes on it, covering them thinly, and taking care that no rocks or sods

be placed on them, but place the rocks or sods near the potatoes for the purpose of letting in the air.

6th. Soon after the sprouts shoot through the ground, plough between the rows with a horse, as near the roots as possible, clear out all the weeds from the potatoes, and add a small quantity of fresh earth to the roots.

6th. At the last ploughing, (which should be before they blossom, otherwise there will be a new set of sprangles, which will cause the growth of a large number of small potatoes,) clear out all the weeds, and placing a little fresh earth round the roots, making the hills flattish, but not high ; in this way, small showers, and even common dew, will afford nourishment, and increase their growth, I keep the ground clear of weeds by pulling them up whenever I see any come up among the potatoes, so that the air and the rays of the sun will easily penetrate to the roots and render them more sweet and mealy.

7th. In the fall, before the roots are dead, they should be dug, shook between the rows, and remain two or three hours in the sun, (for potatoes should be dug in fair weather,) then carried into the cellar, where, to prevent their becoming strong and bitter, they should be kept as much from the air and moisture as possible. I gave this information to my neighbours and friends, and they say it is the best method of raising potatoes ; I also wrote to Dr. Adams, who published the Medical and Agricultural Register, in Boston, in 1806.

Your friend,

BEZALEEL LAWRENCE.

Hon. Josiah Quincy.

INTERESTING AGRICULTURAL CORRESPONDENCE BETWEEN G. W. JEFFREYS, ESQ. OF NORTH CAROLINA, AND COL. JOHN TAYLOR, OF CAROLINE, VIRGINIA.

[From the American Farmer.]

QUERIES ON PLASTER OF PARIS.

PROPOUNDED BY MR. JEFFREYS.

THE following are the queries, to which Col. Taylor has annexed answers on plaster of Paris; (See his letter.)

What quantity to the acre have you generally used?

On what soils does the plaster succeed best?

In what way is it best applied to the soil—with, or without ploughing—with, or without other manure?

Have you repeated the application of it? At what intervals, and with what *effect?*

To what kind of grain, succulent, and leguminous crops can it be beneficially applied? And in what way is it best applied to them?

To what kind of grasses can it be beneficially applied? and in what way is it best applied to them?

What has been the increased product per acre, of grain and grass crops, by means of the plaster alone?

What is the result of the experiment which you have made of setting aside 200 acres, half to be cultivated in corn yearly and alternately, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre.*

* For fear this experiment may not be understood by the question, I will give it more fully in Col. Taylor's own words, "I have set aside 200 acres, (divided into two fields,) half to be cultivated in corn yearly, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre. The repetition of the culture being too quick for a perennial plant, I use the bird-foot clover, as we commonly call it, to raise clothing for the land, having found that the plaster operated as powerfully on that as on red clover. One field produces a crop of corn, and the other being enclosed, re-

COL. TAYLOR'S REPLY.

Port Royal, March 4, 1818.

DEAR SIR—To your questions of the 4th inst. I reply—

1. I sow from three pecks to one bushel of plaster upon an acre.

2. It succeeds upon all soils to which I have applied it; those requiring to be drained excepted.

3. Sown on clover in the spring, it benefits it considerably. Used in any other mode, I plough it in. But I have even discontinued the first practice, from observing, that when plaster is sown and ploughed in with wheat in the fall, a top dressing to the subsequent clover is of little or no use; and from thinking that the effect of the plaster sooner ceases as a top dressing than when ploughed in. The best ways I think of using it, are in the Spring, upon the long manure of the preceding winter, to be ploughed in with it—upon well covered fields to be sown immediately before they are fallowed—in rolling it very wet with seed corn bushel to bushel, and in mixing it with seed wheat so moist as to let the wheat divide in sowing, in such a quantity as that the land shall receive not less than three pecks to an acre. The latter is chiefly for the sake of the succeeding clover. The wheat is benefited in a very small degree, but it prevents embezzlement of the seed.

ceives a crop of ungrazed vegetable matter.--The succeeding year the ungrazed field is taxed with the crop of corn, and the corn field fed with the ungrazed vegetable. In one, the plaster is sown upon the bird-foot clover in March or April, and in the other ploughed in at its fallow. The object of the experiment is to ascertain whether an annual bushel of plaster to an acre, combined with a biennial relinquishment to the soil of its natural vegetable product, will enable it to be severely cropped (cropt) every other year without impoverishment, or with an addition to its fertility. The first effect would suffice to check an evil, every where demonstrating the wretched state of our agriculture; the second would be a cheap and expeditious mode of improving the soil, even where the state of agriculture is good."

G. W. JEFFREYS.

4. I have had a small mill exclusively for grinding plaster during twenty years. In that period I have used several hundred tons, and tried a great variety of experiments, using it every year to considerable extent. I think it a valuable ally of, but by no means a substitute for manure. That there should be intervals of two, three, or four years, between applying it broadcast to the same land. That its effect is graduated by the quantity of vegetable matter upon which it is sown. That upon close, grazed land, it does but little good at first, and repeated, would become pernicious; and that it must be united either with the long manure of the winter, or the ungrazed vegetable cover produced in summer.

5. Corn mixed with plaster is sometimes highly benefited, and almost unexceptionably in a degree, depending chiefly on its alliance with vegetable matter, and occasionally upon the seasons. Its effect upon wheat is before stated. But all crops are ultimately improved by its gradual improvement of the land, including those upon which its effect is not immediately visible. The small crops, vegetable, succulent, or culmiferous, are often benefited by a mixture with plaster, when planted measure for measure.

6. I have satisfied myself that plaster ought to be used to benefit all kinds of grasses, in the modes explained, and that it ought not to be sown as a top dressing. By improving the land, it benefits all kinds of grasses.

7. It is impossible to say how far the plaster, valued exclusively of its vegetable ally, may have increased the crops of grain. Used as a top dressing to clover (red) on land never before plastered, I have often had that grass increased four fold to a line, dividing it from similar land and clover. Spaces left unplastered across large fields, when sown in wheat, have remained visible during the whole season of rest, by the inferiority in luxuriance of a great variety of natural grasses and weeds. The 200 acres you mention have never received any manure, and the corn stalks

have been taken off. But they have been completely secured against grazing. They now produce threefold more corn than when the experiment commenced. The rest of my farm, having had the manure, will produce five fold more corn than it could do twenty years ago. The casualties attending wheat, render that a precarious criterion of improvement.

I am respectfully, Sir,
Your most obd't serv't,
JOHN TAYLOR.

ON FERTILITY.

[From the English Commercial and Agricultural Magazine for 1800.]

Omitting (as at present unnecessary) all disquisition about the component principles of fertility, it seems certain, that Fertility can be induced only by the agency of the air. Among the wondrous modifications of this element, it would be dangerous to assert that, *in some shape*, it is not the actual food of vegetables: to vulgar comprehension it may be proved, that at least it is the *Carrier* of fertility.—In either case the result would not be different.—That air is an accessary to fertility is evident; because vegetable earth* dug at a considerable depth (in sinking a well for instance) produces nothing without considerable exposure:—because, on examining any section† of the Strata under us, though they are seldom horizontal, and still seldomer according with the inequalities of the surface, yet that surface, to a certain depth, is uniformly tinged with a dark colour. If it be urged, that this alteration of colour only results from the decayed generations of vegetable matter through the revolutions of ages, I answer, that roots will follow vegetable earth

* Our language furnishes a word which expresses this complex idea: *Mould.*

† All cliffs on the sea-coast give opportunity enough for this examination.

much deeper than this dusky appearance; and that the roots do not penetrate deeper, because the external influence of the air has not been able to endue the earth with previous fertility beneath the accustomed limit. Again, the constant experience of the utility of fallowing land, is a proof that reiterated exposure to the air is practically a cause of fertility—and there are ancient experiments which have demonstrated that the most sterile Clay may be rendered most fertile by grinding into impalpable powder, and exposing it (thinly spread) for a twelvemonth to the influence of the atmosphere.—It is also certain, that Air and Earth mutually transmit fertility, like the transmission of heat and cold in all bodies in contact; or at least, that there is a certain point of saturation of fertility, beyond which exposure to the air constantly carries off the overplus.—In the case of fresh dung, exposure soon lowers the fertility of its surface down to this point of saturation; and the process of the transmission of some volatile substance is disagreeably sensible to the nostrils. To use a chemical illustration, one might compare fresh dung to warm water saturated with salt; as supervening cold expels all the salt, beyond the quantity soluble in cold water; so supervening air carries from dung a certain quantity of fertility beyond that point which may be compared to the cold saturation of water with salt.—I would infer that air is an agent which continually extracts fertility from all putrescent bodies, and as constantly deposits it on its appropriate recipient, Mould. That like all other affinities, this deposition is far more rapid and copious on Mould, which possesses little previous fertility, than on that which possesses much.—The farther removed the mould is from the point of the saturation of fertility, the more greedily is fertility imbibed by it. Be it remembered, that between Air and Mould is no transmission of fertility where there is no contact.—That the middle of a dung heap retains its fœtid activity on opening; and much *more* safely is fertility retained by mould, which is never half-saturated.

The beneficial operation of fallowing may therefore be thus described: The external surface (having received an accession of fertility from the air) is mingled with the other mould as deep as the plough goes—a surface (mostly) new results, which in its turn is fertilized; and thus successively the mould is enriched according to the repetitions of ploughing, or other mode of admixture.—But, according to the foregoing theory, less and less fertility is induced at each fresh exposure, as the improving mould accedes nearer and nearer to the limit of fertility, and if (instead of exposing a surface already partially fertilized) it were possible to cover the old surface with successive thin coats of *sterile* mould, the first acquired fertility would remain under ground in store, (κειμηλιον), while the acquisition of new fertility would go on with the utmost possible rapidity from the unsated voracity of a more hungry surface—and the oftener such surface was renewed, the faster would be the accession of fertility—" But such superinduction of sterile surface is impossible :" it is so; but it is not impossible to pursue the principle to an efficient extent in practical agriculture by a very obvious and easy expedient. This consists merely in ploughing to a greater depth than is usual. Suppose (for instance) six inches, the usual depth, augmented to nine inches, the new mould laid on the surface by the plough would rapidly imbibe the influences * of the air; and if the less laborious sorts of culture, harrowing and rolling, were sedulously employed to increase the imbibing surface of this new mould by pulverization,† it seems not doubtful that, in the course of a summer, this new mould would imbibe much more fertility

* The effect of a *change of air* on the human frame is proof enough of the powerful mutual action of air and mould; for as the air is so constantly moving, it can only be the immediate impression of the contact of the last hour or two, that stamps the discrimination. That contact must needs be very efficient.

† A clod of a cubic inch may be supposed to increase the surface accessible to the air *tenfold* by pulverization.

from the air, than would any exposure of mould already tolerably fertile. This for the first year: afterwards no separation of the old and new mould could be effected; but the increment of fertility would still be greater than under the circumstance of shallow cultivation. For, if after an exhausting crop, two fields ploughed to the different depths of six and nine inches be left equally impoverished, the total remaining fertility of the nine inches equal to the total fertility of the six inches: it is evident that *each component part* of the first must be poorer as 3 to 2; therefore every surface of the first must be more attractive of fertility in that proportion; and, in the successive exposures of cultivation, the same comparative ratio of improvement from the influence of the air must result *ad infinitum*. On the whole, I would argue,—that the passing air is the general cause of fertility; that a *greater* quantity of this beneficial influence will be imbibed by the poorest mould; and that deeper cultivation is a very possible expedient for presenting sterile mould for this more rapid imbibition of fertility.*

The objection against deeper cultivation is of a temporary nature; that it will bring into vegetation those seeds of weeds which are every where buried in the earth; and though these are usually slight annual weeds, some additional labour is required for their extermination. As to the constant additional labour of deeper ploughing, it repays itself as acting as an insurance against the injurious effects of drought and rain. In a drought the lowest roots will supply more moisture than usual from their deeper situation; in excessive rains, the upper roots remain considerably less

* To what can the superior fertility of gardens be attributed, except the deeper action of the spade than of the plough? The larger quantity of dung which is sometimes bestowed on gardens is due to them of right; for they produce *more* vegetables, the immediate origin of more dung. Their superior vegetation is indeed augmented by dung; but that very dung has been produced from their deeper cultivation. Every thing has a right to its own re-actions.

drenched than usual; because, in tenacious lands, water sinks immediately to the bottom of the ploughing, and its detention, at nine inches from the surface, leaves a drier situation for the upper roots than if it were detained at three inches nearer to them.

ON A MODE OF DESTROYING INSECTS.

Dorchester, April 26, 1820.

DEAR SIR,

I TAKE the liberty of indicating a method of destroying the rose-bug, and other winged insects, which are such nuisances in our gardens, and so destructive to the tender shrubs and plants, which was suggested to me by the following occurrence. Going into my garden one summer evening, with a lanthorn, to gather sallad, I found, on my return to the house, that the lanthorn was covered with rose-bugs and other insects, which had been attracted to it by the light. This simple circumstance led me to the inference that *the propensity of moths and all winged insects to fly at a light, will furnish us with the means of at least diminishing their number by suffering them to become* SELF-DESTROYERS.

It is well known how troublesome they are by thronging our rooms in the evenings, where a candle or lamp is burning; how they fly round it, and scathe their wings in its blaze; and how they pelt against the windows, which we are obliged to shut in order to exclûde them. Now, I conceive, that availing ourselves of this lure, we might kindle small fires in different parts of our gardens, near the vines particularly, which are annoyed by these voracious depredators, *and they would precipitate themselves into the blaze.* A kind of flambeau might be made, by winding round one end of a stick about a foot and a half long, old rags, or swingled tow, dipped in tar or melted brimstone. Let this be stuck into the ground, and set on fire with a candle; and

it will continue burning a considerable time, and prove the funeral pyre to myiads. These lights might be so placed as not to injure the adjacent plants, nor endanger surrounding buildings, as no sparks would fly from them; and, if any fears are entertained, they might be watched till they were burnt out, and the effect would be thus ascertained, in order to justify the repetition of the experiment.

I have often found the difficulty of freeing my plants from the ravages of insects, especially of the *coleopterous* class, because they have a kind of coat of mail covering their wings that sheds off whatever is sprinkled over them with the purpose of destroying them, and because they occupy generally the under sides of the leaves, or frequent high branches where they are inaccessible: but they would be tempted to fly down to a blaze. The various kinds of *moths*, (parents of most destructive broods,) and the winged *aphides*, those great destroyers of the grape vine, would more certainly be lured by a bright flame to inevitable destruction.

Perhaps a flambeau, at the end of a long pole, might be held up near to apple trees when in bloom, and be the means of destroying many of the small flies which deposite those eggs in the opening blossom that form the worm generated in the core of the fruit.

In the early summer I have observed immense swarms of minute black flies, just at evening, around the plum trees; and suspect them of being the occasion of those galls, or excrescences which occasion such injury to the tree. If so, the expedient which I have suggested, may be tried to advantage upon them.

These remarks are, perhaps, too trivial to be communicated to the public in the Agricultural Repository and Journal. If, however, you think that they may serve to suggest expedients to those who have leisure and opportunity to make the trial, you will please make that use of them.

With affectionate regards,

Your friend,

THADDEUS MASON HARRIS.

MR. DERBY ON THE GROWTH OF EARLY POTATOES.

Salem, Dec. 1, 1820.

DEAR SIR,

OBSERVING the produce of a few potatoes, which I transplanted the last year, to be very good, I was induced this season to try the experiment upon a somewhat larger scale. About the first of April I took some late white potatoes, after cutting them, placed them in a hot bed, as close as they could lay, and covered them with earth. On the 24th of April, the plants being in fine order, some of them twelve inches high, I took them up and separating all the shoots but one from the parent potato; I made drills about three feet apart with a hoe, and filling the same with well digested manure, I transplanted as I should cabbage plants, the whole of the shoots about nine inches apart in the drills. On the 3d of May, there was a very sharp frost, which injured the tops of the plants very considerably, they in a few days recovered, and grew very rapidly, scarcely one of them failing. The rows were twice hoed. On the 30th of June I commenced using new potatoes, the size large, and very fine, equal to any taken up in October: finished digging them on the 10th of August; the land measured 90 by 52 links of the chain, on which stood one pear, and one plumb tree, and produced at the rate of 293¼ bushels per acre. The rows might have been much nearer, consequently the produce would have been greater. I could not perceive any difference in the yielding of the plants. between those which were separated, and the ones which adhered to the potato. Should I try the experiment again, I should take all the plants from the potato, and replant it, as it appeared as fresh and sound as the day it was first put into the ground.

E. HERSEY DERBY.

Hon. Josiah Quincy.

MR. JACKSON ON WHEAT.

Plymouth, Dec. 6, 1819.

DEAR SIR,

FROM the known interest your take in the agriculture of the Commonwealth, and the influence your situation, as one of the trustees of the society, so justly gives you, permit me Sir, to suggest some reflections on the importance of a more general attention to the culture of wheat, an object which the society has deemed worthy its patronage, and for which it annually bestows its bounty: but I imagine something more particular and personal is necessary to produce the effect that is desired, and all that is practicable; there is a prevailing prejudice, an unfounded opinion, among the farmers, that it is an *uncertain crop*. I think too much pains cannot be taken to eradicate such an opinion, without which the premium bestowed by the society, will be, but of partial benefit; there are some persons who always raise this crop, and he who fortunately succeeds in raising the best, will also obtain the premium from the society; but *almost* every farmer ought to raise the wheat for his family, and not be dependent on the southern planter for his bread. I say ought, from the conviction, from actual experiment, that it is as certain, and the most profitable crop, he can raise, and at the same time the least injurious to the land. Any land which is suitable for upland mowing, is also suitable for wheat; and with no grain does the grass seed take so uniformly well.

The land I cultivate is a stiff loam, not dissimilar to the land which was ploughed at Brighton, at the ploughing exhibition, but not so moist. The rotation I observe is (whether on pasture land or mowing,) from the green sward, to plant two years with potatoes, or with corn and potatoes, always following the potatoes with wheat and grass seeds; my crop is from 18 to 25 bushels to the acre: the two years while

planting, I manure the ground well in the holes, say 25 tons to an acre ; when I sow the wheat, and grass seeds, I put on no manure, except some part of the field is very cold, in which case I spread on a light dressing and plough it in.—When the land is in high order I consider it as injurious to the crop of wheat, to manure it, as it forces the straw too much, and occasions it to lodge, although it may benefit the after growth of grass. In preparing the seed for sowing, I adopt no precaution, more than that of soaking and liming, which I believe is the general practice, from the repeated notices, as published in the journals of the society, and which, I think, is an effectual security against smut, (except the seed sown is smutty) : I have never had my wheat affected with it, in the smallest degree ; although I have seen that which was sowed with the same precaution, of soaking and liming, so smutty, as not to be worth the reaping—but the seed that was sowed, was as bad as the crop ; which was conclusive to my mind, that although liming was a *preventive* against smut, it was not a *remedy*, " for such as you sow so shall you reap :" too much care cannot be taken by those who would reap clean wheat, to procure the seed that is perfectly clean. I will not undertake to say, that smutty seed cannot be cleansed, by care, and frequent ablutions, and rubbing, but it is far easier to procure that which is clean, and then preserve it so by care. Through the goodness of Nath'l Gilman, Esq. of Exeter, I obtained in the fall of 1816, a bushel of seed wheat, the species, he obtained from one ear, which he fortunately obtained from a person who brought it from some port in the Mediterranean, the grains of which are remarkably large, and fair, each weighing down three grains of our common wheat ; it has been sowed in this country 7 or 8 years, and has never, yet been affected with smut or mildew. I have sowed it two years, the first year I had fifteen and a half bushels from three quarters of an acre, sowed in an orchard ; the present year, I had twenty two and a half bushels from an acre, the season was not considered good for English grain generally, being

too hot and too dry; mine suffered considerably from the drought. I shall feel myself happy to distribute this seed to any person who desires it, as I consider it an invaluable acquisition to the country, and to the agricultural interest particularly.

WM. JACKSON.

P. S. My brother, from three quarters of an acre, the present year, raised twenty six and a half bushels, being the rate of thirty five bushels and ten quarts to the acre: he would have applied for the premium, if he had had an acre.

COMPARISON OF THE STATE OF VEGETATION IN THE SPRING FOR SEVERAL YEARS PAST.

We have published at different times in this Journal accounts of the progress of vegetation in the early part of the season. We have been incited so to do, partly by the example and authority of many eminent men, such as the celebrated Linnæus, the Hon. Daines Barrington, and others, and partly by the hope, that it might throw some light on one of the most important subjects of agriculture, the proper times of sowing and planting. We are aware, that no direct and immediate inferences can be, in our present state of knowledge, drawn from such an history of vegetation. It may require the experience of many years, a collection of a great variety of facts, to enable us to deduce safe conclusions; and perhaps, after all, our efforts may prove to be unavailing, and we may be compelled to trust our agricultural measures, in this important point, to chance, or to the elements.

Still, however, it must be admitted, that a collection of facts must be the only sure foundation of enlightened theory and practice; and it is not in our power to say, that certain useful rules and principles may not hereafter be deduced from such a record of facts.

It is at least a very amusing exhibition of the course of nature, and it tends to show a great uniformity in her operations. It checks presumptuous assertions and complaints of the inequality and irregularity of the seasons, and tends to convince us that the author of nature governs by laws, less variable and less capricious than disappointed or impatient cultivators are apt to imagine. We shall give the time of flowering of various trees and plants for a period of eight years, with some few exceptions, in which our records were imperfect. The correctness of those which we have inserted may be relied upon. The period we have fixed is that of the *first* opening of *any flowers*, however few, on the plants or trees in question. The reason of our adopting this rule will be obvious to every intelligent observer, since almost all the trees in question continue from day to day opening more and more flowers for a period generally of ten or even twelve days, and, if you should wait till the trees were most fully in blossom, it would be very vague, and different observers would vary at least eight or ten days in their respective accounts, though if they had adopted the rule of stating the time of the first fully expanded flowers they might be found precisely to agree. Another remark of some importance should be made. We not only have made our observations on the same kind of tree, but on the same individual tree. Every one must know that situation and soil may make one tree more forward than another of the same species, by at least a week.

One other observation may not be thought improper in favour of this sort of record, that it may serve to ascertain the precise difference of seasons in every state in the union. For we cannot doubt, that an example so innocent, so amusing, and probably useful, will be followed.

Nor is this comparative state of the seasons in the different states of small moment. We have horticultural works and agricultural publications from the presses of almost all our states, and without a comparative acquaintance with the

different progress of vegetation in these several states, how can we follow, or know how to apply their rules? If any man should sow, plant, or manage his garden, in New-England, by the authority of M'Mahon, whose experience was founded on the climate of Pennsylvania, he would make most serious mistakes.

If he were to plant the sweet potatoe at the season in which it is planted in Carolina, it would certainly never vegetate; and he must allow a fortnight between even the Jerseys and Massachusetts. Yet he ought not thence to infer that our season is too short for the sweet potatoe, since our vegetation is rapid and vigorous in proportion to its tardy appearance. Thus to take this same plant: We have gone on for 170 years under the presumption that this was a plant not destined for us; that it was our forbidden fruit; but it is well ascertained that we can produce it in perfection.

We now proceed to our comparative view.

CHERRIES

Began to open their flowers as follows:

In 1813. May 10.
1815. May 10.
1816. May 6. The memorable cold and unfruitful season.
1817. May 6.
1818. May 17.
1819. May 6.
1820. May 2.
1821. May 9.

Average time of flowering of the cherry by the above statement, May 8.

PEARS

Began to open their flowers:

In 1813. May 20.
1816. May 12.
1817. May 7.
1818. May 24.

1819. May 17.
1821. May 13.

Average time of flowering of the pear, by these observations, May 15.

PLUMS

Began to blow:

In 1815. May 14.
1817. May 7.
1818. May 21.
1819. May 13.
1821. May 11.

Average time of flowering of the plum, by the above, May 13.

MESPILUS CANADENSIS, OR SNOWY MEDLAR,

A native plant, not under cultivation, began to open its flowers:

In 1813. May 11.
1815. May 16.
1816. May 9.
1817. May 8.
1818. May 18.
1819. May 16.
1820. May 3.
1821. May 10.

Average period of opening of the Mespilus Canadensis, May 11.

APPLES

Began to open their flowers:

In 1813. May 23.
1816. May 18.
1817. May 12.
1818. May 25.
1819. May 20.
1820. May 11.
1821. May 17. Though some few appeared 4 days before, on the Siberian crab.

Average time of first expanded flowers on the apple, May 18.

From the above comparison it appears that the extremes seldom, and, indeed, we may almost say never, exceed fifteen days: that is, that the earliest period of flowering of any given plant, does not vary from its latest period of flowering in different years, more than 15 days. We are authorised to draw this conclusion, because we think that the above years probably comprize the earliest and latest seasons which have been known for 40 years. The season of 1818 was backward beyond all ordinary example, and yet was fruitful. The season of 1820 was *as remarkably early*, and yet few seasons ever exceeded it in fruitfulness. Not a single tender fruit suffered from the very early flowering. The cold and calamitous summer of 1816 was quite an early one, and very promising at first. We ought not, therefore, to be alarmed or anxious either at an early, or late spring. It will be seen, that each of the above-mentioned trees approach as to the time of its flowering to the mean time, in much the greater number of years. In general, they blow 2 or 3 days either before, or after, the mean time. It may not be thought uninteresting to add to the above account of the time of flowering of sundry trees, the first appearance of ripe fruits, and productions. It will be recollected that we have not given an account of this sort in our Journal for several years past.

Strawberries first ripe—

In 1813. June 20.
1815. June 21. Strawberries in considerable quantities.
1818. June 25. This was the latest year known for many years.
1819. June 21.
1820. June 20.

It must be interesting to perceive, that whatever the variations may be in the flowering of plants, the time of ripening is so nearly equal. Instead of the extremes varying 15 days, as in the case of flowering, we find them varying in

ripening, but five days. That the mean time of ripening of the strawberry is the 21st of June, and that in four years out of five it ripens on that day, or only one day from it. This again proves the folly and rashness of complaining of too early or too backward seasons.

Cherries first ripe—

In 1813, June 26. Gathered as unripe as if designed for the Boston market, where ripe cherries are never seen till they become a drug.

In 1815. Unripe cherries gathered June 24th.
Ripe black hearts July 3d—The black heart is not the earliest though not a late cherry.

In 1816. First cherries gathered July 4th.
Black hearts ripe July 6th.
Black hearts generally ripe July 8th.

In 1818. First early and unripe Boston market cherries gathered July 2d.

In 1820. Early May cherry fit for table June 21st.
Black hearts ripe July 4th.
All cherries in perfection July 8th.

It will be seen that the cherries of various kinds differ much from each other in the time of maturity, but to take the best, the black heart, by whatever name it may be called, as the rule, it may be affirmed that their mean time of ripening is the 4th of July. By ripeness we intend a very different thing from what our excellent and industrious neighbours who raise for the market, mean by the same expression. We understand that state of the fruit in which it has arrived at perfection, which is from five to ten days later than the Boston connoisseurs ever see it, unless they continue to purchase it after it sinks to six cents the quart, and when it is rather a jelly before it gets to market, than a fruit.

May we not here introduce a practical remark for the benefit of our Boston friends and customers. Can they not insist by proper rewards, which is the only mode, that their strawberries shall be carried to them in pottles, that is in in-

verted cones of basket work ; and that the cherry should be carried to market in some better mode than potatoes, which are always transported in bulk ?

We respectfully suggest these ideas, because we know that the Boston epicures pay more liberally and are worse served, than any people in Europe, Asia or America.

Things have been mending, it is true, in this respect, but never was a generous, luxurious people furnished with less regard to their comfort and taste than the inhabitants of the "head quarters of good principles."

We ought in justice to our thriving and intelligent neighbours to state, that they have made, and are constantly making great efforts, from year to year, to supply the market with earlier vegetables, and in better condition. They have learned to raise the cabbage, and the lettuce the fall before, and to preserve them in hot bed frames—but ought not the opulent town of Boston to have the cauliflower always in perfection ? and the sea kale ? and the salsafy ? and the Brussell's sprouts ? We think they are entitled to it ; and to a better mode of conveying the nicer productions. This a generous price, and a discrimination between those who take pains to please, and those who do not, will alone effect.

Raspberries and gooseberrries (which usually ripen together) began to ripen

In 1813. July 12th.
In 1815. July 15th.
In 1820. July 10th.

It ought to be noticed that these remarks were made on a single estate. Other persons with more favourable situations may have raised these fruits at earlier periods ; but we must protest against a comparison with the periods at which they first appear in the market, it being notorious that unripe fruits are always sent to the Boston market in the early part of the season.

Still our comparison may well serve as a guide to show the relative state of each season, and of the va rious fruits of our country.

Roxbury June, 5, 1821.

REPORT OF A COMMITTEE TO WHOM WAS REFERRED THE APPLICATION OF MR. E. HERSEY.

THE committee appointed by the trustees of the Massachusetts Agricultural Society, to inquire into the facts relative to the destruction of the worm commonly called the borer, which has of late years been so injurious to the apple trees, in this neighbourhood, and to ascertain whether any thing be due to the exertions and adroitness of Mr. Ebenezer Hersey, of Roxbury, housewright, and generally known as a successful *Grafter*, in destroying this troublesome and voracious insect, beg leave to report:—That they find, although it be uncertain whether Mr. Hersey was the first person who discovered the easy mode now practised by him in taking the insect from the body of the tree, yet they are satisfied that the great advantage which the public are like to derive from the extirpation of this worm, is principally owing to the exertions and cleverness of Mr. Hersey, in this branch of his profession, and they recommend that a premium be awarded him of twenty-five dollars.

Your committee feel it incumbent on them to state for your information, that Mr. Hersey has extirpated the insect in at least a thousand apple trees on *one* farm in Roxbury; that he has probably saved many thousand in other parts of that town and its neighbourhood, either by his personal attendance and labour, or by the information which he has given to others on the subject; that he has restored to vigour and soundness, many valuable peach trees that were gummy and rapidly declining from the effects produced by this or a similar worm; that he has traced them to the mountain ash, and saved many of those beautiful trees from perishing: and your committee have no doubt, if, from this example, the farmers of this commonwealth will examine their orchards, and cut out these insects from their trees wherever found, they will in

a short time feel the benefit of their attention in the increase and improved quality of their fruit.

Your committee feel it their duty also to add, that from their own experience, they feel assured, that all those who can command the services of Mr. Hersey, with find it more economical to employ him to perform this work than to undertake it themselves; as his experience and original profession of housewright, acquainted with the use of tools, enables him to do it not only more thoroughly, but very much quicker than any one can who has not been in the practice of the art.

The seasons when this operation is performed with most effect are the spring and fall; and if in the spring, before the month of June, as the perfect insects escape before that time. In apple and mountain-ash trees, the existence of the animal in the tree may be generally known by the mossy appearance on the bark; and it may be traced by removing a little earth from the body of the tree next above the insertion of the great roots. Although the hole at which the insect enters is in many instances very small, yet it is easily discovered by an appearance of powdered wood or fine saw dust which is thrown out by the worm; here you may introduce your chissel and follow his track. Cut the bark smooth, and when you have cleansed the trees of all the insects (of which there are sometimes as many as twenty to be found,) plaster the wounds over with a little clay, and when it is dry restore the earth to its place. The operation should be renewed the succeeding season to make the work complete. In peach trees the insect is traced by the gum, but as this is also produced by bruises, it is not infallible.

SAM'L. G. PERKINS,
JOHN PRINCE, } *Committee.*

Note.—If the frost be out of the ground, we recommend to farmers to perform the spring cleansing as early as March and April.

Boston, April 16.

AGRICULTURAL INTELLIGENCE.

Mr. Young and the Halifax Agricultural Societies.

We have forborne to notice the extraordinary revolution in agricultural efforts in Nova Scotia, (which has been produced, as it would seem, principally by the intelligence, learning and indefatigable exertions of a Scotch gentleman, who has within a few years removed from Scotland to Halifax, John Young, Esq.) not most assuredly from any spirit of rivalship or envy, and still less from any national feelings, but simply because we have been in constant expectation of seeing Mr. Young's admirable essays embodied and circulated throughout this continent. This gentleman published a series of numbers on agricultural subjects, in one of the newspapers at Halifax, which we do not think we hazard much in asserting, contained more profound thoughts on the subject of agriculture, and embodied a greater extent and variety of science applicable to this art, than has yet appeared from the pen of any individual in this country.

Though the essays were anonymous, they soon attracted universal attention in that province, and excited a spirit of inquiry, and an ardour for improvement, which we may truly say is without a parallel. So perfectly was the secret of the author kept, that the essays were attributed to his Excellency the Earl of Dalhousie, and they might well have added to the splendour of any titled man.

The excitement produced by them was so great, that this province, comparatively poor when put in contrast with some of the powerful, and opulent, and more fertile states of our confederacy, voted large sums to endow provincial and county agricultural societies ;—sums which might well put to the blush the more parsimonious efforts of our own republic.

A secretary of the board of agriculture in Nova Scotia was provisionally appointed, with an understanding, that whenever

the justly celebrated author of these essays should be known, that office should be vacated in his favour.

Mr. Young was persuaded by his friends to quit his retirement, and was with universal approbation promoted to the office of secretary and treasurer, and as far as we can judge, efficient manager of the institution.

It is difficult for persons at a distance to ascertain the precise value of these efforts, but so far as we can judge from the reports of the board of agriculture of that province, we should be disposed to believe that it had been fully equal to the extraordinary diligence, vigour, intelligence and learning which first excited and directed them. New systems have been introduced with great success;—new directions have been given to industry. Some facts most extraordinary with regard to the changes produced in the culture of that province have been published by the provincial society, of which no doubt can be entertained;—and it would seem, that this cold, and as we have thought, inhospitable soil, is very likely to be a rival to ours, in the most valuable agricultural productions. We do not enter further into particulars, because we still hope to afford by a review of Mr. Young's essays, and successful exertions, complete evidence of the wisdom and energy of his plans.

We feel sure, that on a subject so interesting to the whole human family, no prejudices will operate to prevent the free circulation of his opinions, and that a disposition will be felt to render full justice to his merits. In New England especially, we have abundant reason from the similarity of climate to listen with impartiality to so wise a counsellor as Mr. Young, educated in Scotland, whose climate and productions are so analogous to our own.

New-York Agricultural Publication.

We have seen a recent publication from the board of agriculture of the state of New-York. It would be, perhaps, little praise to a state so full of intelligent and enlightened

men to say, that the work is entitled to respectful attention. There are two essays of considerable length which occupy the greater part of the volume.

One of them is avowedly written by Mr. Featherstonehaugh, of Duanesbourgh, and the other would seem to be the work of the same author. They are, both of them, highly respectable, and ought to excite a spirit in Massachusetts to sustain the character of the state by publications of equal merit.

We did not feel ourselves at liberty to make any extracts from the work, because we understand, that a review of it is expected in a publication, which has a wider circulation, and which is entitled to more, and higher consideration, than the very humble and unpretending Journal, which we address to the farmers of Massachusetts.

New-Hampshire State Agricultural Society.

We have understood that this state has made provision for, and incorporated a general state society, the members of which are to be composed of delegates from the county and local societies. With us we have no such establishment. The Massachusetts Agricultural Society has nothing which gives it either authority or pre-eminence over any county society. Nor do we wish that any such power should be delegated. We cannot conceive any advantage which could be derived from any general society.

If local, with general powers, it would be the object of jealousy. If composed of gentlemen from all parts of the state, its meetings would be few, formal, expensive, and productive of no substantial good. All that agricultural societies ought to wish, is a charter to enable them to manage their funds, and occasional aid from the legislature to enable them to give that spring to agricultural experiments which is the soul of all exertion. A little money, and some distinction, are admirable helps to individual efforts. A man who makes great exertion to reclaim a stubborn piece of land, to produce a great crop, to raise a fine animal, wants

something besides the consciousness of the value and importance of his efforts, to reward him. And the public want this notoriety more than he does.

Successful efforts are often lost to the public, owing to the diffidence of the individual and the difficulty of making them known. Can there be a wiser or more economical application of the public money than restoring a small part drawn from the subject in the form of taxes, in the shape of premiums to encourage the increase of products, and thus, in its turn, increasing the ability to pay taxes, and enlarging the fund from which they are drawn?

We are, for the reasons above stated, against any general society with superior powers, or even titles, but in favour of an increased liberality towards the local societies which either do, or may hereafter exist.

A communication from the Hon. Timothy Pickering, on the culture of peas, has been, by some accident, mislaid, after being ordered for publication, and must, of course, be postponed till our next number. We regret it, because we always feel a sincere pleasure in perusing the plain and practical articles from the pen of this venerable and experienced cultivator, and we are convinced that they are highly useful.

That accidents such as this may not be attributed to negligence, we would observe, that the duty of editing this Journal, is not unfrequently divided; and, between various members of a committee for publication, papers may occasionally be mislaid, without any imputation of neglect.

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